

WHY ABSTAIN FROM SEX? BUILDING AND PSYCHOMETRIC TESTING OF
THE SEXUAL ABSTINENCE MOTIVATION SCALE (SAMS)

A Dissertation

by

SARAH CATHERINE DUNSMORE

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2005

Major Subject: Health Education

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Approved by:

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ABSTRACT

Why Abstain from Sex? Building and Psychometric Testing of
the Sexual Abstinence Motivation Scale (SAMS). (December 2005)

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An understanding of both sexual activity and sexual abstinence among young people is crucial in preventing the negative consequences of early sex initiation. The study of motivation is essential for health educators to be effective in persuading individuals to adopt healthy behaviors and avoid health-compromising ones. A discussion of the multi-dimensional construct of motivation for sexual abstinence is absent from the adolescent sexual behavior literature. Within this study, in-depth brainstorming sessions among college students and the construction of concept maps were used to identify and visually represent potentially relevant dimensions of motivation for sexual abstinence. Based upon these results, the Sexual Abstinence Motivation Scale (SAMS) was developed and psychometrically tested with a pilot group, as well as a statistically representative final group from two major universities in central Texas. Based on the results from this exploratory analysis, the final version of the SAMS included eight scales and 41 items. The eight factors were: Commitment to Self-Schema, Risk of Disappointing Authority Figures, Fear/Apprehension of the Sexual Experience, Fear of Physical Consequences, Value of Virginity, Reputation Regret, No Opportunity/Not Important, and Manipulation. The analyses of the psychometric

properties of the SAMS lend support to the validity and reliability of scores it generated. The examination of convergent validity of the SAMS showed significant negative correlations with the Sexual Ideology Instrument -- an indication that the instrument appeared to be measuring motivation for sexual abstinence. Adequate reliability computed through Cronbach alpha demonstrated the items in the SAMS were measuring the same construct -- motivation for sexual abstinence. Prior to this study, assumptions about factors of motivation for sexual abstinence and their possible structure were unknown. Based on results of this examination, preliminary elements now exist that can be tested for the development of these assumptions. The dimensions uncovered in this analysis contribute to the development and refinement of a theory of motivation for sexual abstinence. Further examination, specifically confirmatory factor analysis using the SAMS, is needed.

DEDICATION

To my sweet pea

ACKNOWLEDGMENTS

I would like to thank my committee chair, Dr. Patricia Goodson, who provided me not only with advice and guidance, but also with friendship. I would also like to thank my committee members, Dr. Steve Dorman, Dr. Buzz Pruitt, and Dr. Pat Lynch, for their guidance and support throughout this research.

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CHAPTER I

INTRODUCTION

The purpose of this study was to design and psychometrically test a multidimensional scale to measure adolescents' and young adults' motivation to remain sexually abstinent. The various dimensions of motivation for sexual abstinence were uncovered through both qualitative and quantitative methods, and were used to construct the Sexual Abstinence Motivation Scale (SAMS). The resulting instrument was psychometrically tested with a pilot group, as well as a statistically representative sample of college students.

Prevalence of negative consequences of early sex initiation such as sexually transmitted diseases and unintended pregnancies has vaulted study of adolescent sexual behavior to the forefront of sexuality research (Aggleton, 1995; Grunbaum et al., 2002; Kirby, 1997). While an attempt at understanding why students choose to engage in sexual activity at an early age has been made by researchers in this field, most specifically investigate antecedents of *sexual behavior* (Kirby, 1997; Miller, 1995). Examinations into the antecedents of *sexual abstinence*, however, have been less frequent and have resulted in a significant gap in the literature surrounding this line of research (Dunsmore & Goodson, unpublished manuscript).

This dissertation follows the style of *Health Psychology*.

An antecedent can be defined as an occurrence that precedes another (Berube, et al, 2001). In an attempt to discover what precedes adolescent sexual activity, Kirby (1997; 2001) specifically focused on antecedents to both identify young people who are at risk for sexual initiation and to design effective interventions to deter this behavior. By uncovering what directs adolescents' decision to engage in sexual abstinence, identification of those who are/are not abstaining as well as design of effective abstinence programming are also possible.

Motivation can be defined as the processes through which behavior is energized and directed (Deci & Ryan, 1985). Motivation is viewed as the basis for cognitive, biological, and social regulation of behavior and valued for its power to mobilize individuals to act or refrain from action (Ryan & Deci, 2000). Health education relies on both the mobilization of action toward healthy behaviors and on abstinence from risky behaviors to foster healthy lifestyles. For this to be accomplished, motivation must be studied and better understood by health researchers.

Identifying antecedents, or the motivation, behind adolescent sexual behavior is important for the development of effective programs that could impact healthy behaviors (Kirby, 2002, Satcher, D., 2001). Although the factors for engagement in sexual activity have been well documented within social science research, factors influencing sexually abstinent behavior are missing (Kirby, 1997, 2001). An examination into motivation for sexual abstinence is an important addition to the adolescent sexuality research as well as essential for effective abstinence education programming

Lack of prior research surrounding motivation for sexual abstinence requires that an in-depth and organized exploration into the structure of these constructs be undertaken. Conceptualization through use of concept maps, has recently emerged as a method of objectively representing thoughts and ideas surrounding complex constructs, such as motivation for sexual abstinence (Trochim, 1989). This conceptualization process is a technique capable of uncovering the dimensions of motivation for abstinence.

Once a concept has been thoroughly described and defined, factors that describe that concept can be measured (Ghiselli, Campbell, & Zedeck, 1981). Concepts such as motivation for sexual abstinence, unable to be directly observed, are often difficult to measure, perhaps resulting in lack of psychometrically sound measurements of motivation for abstinence. Results of a thorough literature review have revealed no existing tool designed to measure motivation for sexual abstinence.

Construction of a measurement tool to assess motivation to remain sexually abstinent warrants consideration of motivation's multidimensional and latent nature. Motivation is considered a construct based on various factors (Ryan & Deci, 2000). The various factors used to infer the meaning of motivation for sexual abstinence must be uncovered and tested to gain insight into this construct. Multi-dimensional measures provide researchers with the ability to understand the complexity of a construct and its factors such as internal interests and beliefs, or external concerns or influences (Ryan & Deci, 2000).

When expectations about the number and structure of underlying factors do not exist *a priori*, exploratory factor analysis is employed as the preferred technique to test the dimensionality of a construct (Thompson, 2004). Exploratory factor analysis is a method by which to determine the number of factors underlying a set of items (DeVellis, 2003). This method is also useful in providing elements that can further be tested in the development of a theory – in this case, the nature of motivation for sexual abstinence (Thompson, 2004).

This study represented an attempt to clarify ambiguity surrounding the construct of motivation for sexual abstinence, and was organized into four chapters. This introduction served as Chapter I of the study – the organization of the paper as a whole.

Chapter II detailed the process of conceptualizing motivation for sexual abstinence using Concept Mapping (Trochim, 1986). In this process, the various dimensions of motivation were uncovered through the organization of ideas generated from two groups of university students in central Texas. Multidimensional scaling and cluster analyses were utilized to organize those ideas and create clustered dimensions.

Chapter III used the dimensions of motivation for sexual abstinence conceptualized in the first study to create a preliminary version of the Sexual Abstinence Motivation Scale (SAMS). This preliminary version was then psychometrically tested on both a pilot group and a statistically representative final group of university students to ascertain whether the SAMS yielded consistent and valid data. Item selection was then preformed to compose a final version of the SAMS based on the exploratory factor analysis employed.

Chapter IV is the conclusion, or a broad summary of this study. This chapter presented the final SAMS instrument and highlighted the main findings of the study. Strengths of this investigation were presented as well as directions for further research.

Moreover, several bits of information that may be important if the reader wants more detail on the study, were included as appendices: Measurement Theory (Appendix A); Data Collection (Appendix B); Additional Variable & Pilot Results (Appendix C); Additional Clusters (Appendix D); Pilot Information Sheet (Appendix E); Final Information Sheet (Appendix F); Emails for the Final Test (Appendix G); Outline of the Study (Appendix H); SAMS Pilot Version (Appendix I); SAMS Final Version (Appendix J).

CHAPTER II

CONCEPT MAPPING

Introduction and Purpose

The purpose of this study is to conceptualize the various dimensions of college students' motivation to remain sexually abstinent. Acting as the first stage of a larger study, this paper will discuss how a structured conceptualization process uncovered the dimensions of motivation for sexual abstinence. In the future, the resulting dimensions of motivation and various implications from this study will be used to develop a scale to measure motivation for sexually abstinent behavior among young adults/college students.

An understanding of both sexual activity and sexual abstinence among young people is crucial in preventing negative psychosocial consequences resulting from early sex initiation, such as sexually transmitted diseases (AIDS, chlamydia, syphilis, among others) (Grunbaum et al., 2002; Kotchick, Shaffer, & Forehand, 2001) and unintended pregnancies (Aggleton, 1995; Kirby, 2002). Early sex initiation in adolescents may also be linked to other problems such as poverty, social disorganization, and a loss of interpersonal skills (Billy et al., 1988; Howard & McCabe, 1990; Kirby, 2001). Insight into what drives adolescents to either abstain from or engage in early sexual activity may help in combating these physical, psychological, and social issues.

The study of motivation is essential for health educators to be effective in persuading individuals to adopt healthy behaviors and avoid health-compromising ones

(Gebhardt & Maes, 2001). Motivation can be defined as the processes through which behavior is energized and directed (Deci & Ryan, 1985). Motivation is viewed as the basis for cognitive, biological, and social regulation of behavior and valued for its power to mobilize individuals to act or refrain from action (Ryan & Deci, 2000). Health education relies on both the mobilization of action toward healthy behaviors and on abstinence from risky behaviors to foster healthy lifestyles. An understanding of motivation, therefore, is essential for the promotion of health behavior (Dunsmore & Goodson, manuscript under review).

More than 100 different antecedents have been identified within the sexual behavior literature in reference to various types of adolescent sexual activity (Kirby, 2001). Many of these antecedents are motivation-related. The most strongly related factors associated with sexual behavior in teens are beliefs, attitudes, and skills (Kirby 2001). Given how various psycho-social and behavioral theories define motivation (Dunsmore & Goodson, unpublished manuscript) many of these identified antecedents either mediate, moderate, or determine motivation for sexual activity (for example: intention and self-efficacy).

Identifying antecedents of adolescent sexual behavior is important for the development of effective programs that could impact such behavior (Kirby, 2002, Satcher, D., 2001). While the social science literature is beset with factors that influence engagement in sexual activity, having multiple sex partners or using protection from STIs and pregnancy, those factors that influence an adolescent's choice to remain sexually abstinent are not, yet, as clear. It may be premature to assume that the beliefs,

attitudes and skills that lead an adolescent to engage in sexual activity are similar to (or, perhaps the opposite of) those factors that would lead him/her to abstain from such activity.

Abstinence education has been proposed as a possible solution to preventing unhealthy adolescent sexual behavior (Landry, Kaeser, & Richards, 1999; Khouzem, 1995; Maynard et al., 2005). The federal government created an entitlement program in 1996, providing \$50 million per year for five years for abstinence-only-until-marriage programs (*SIECUS*, 2001; Maynard et al., 2005). Funding for these programs has increased substantially since the creation of this entitlement program in 1996 (Sonfield & Gold, 2001). The U.S. Senate Appropriations Committee recently approved a 1.8 million dollar increase for abstinence-only-until-marriage programs (*SIECUS*, 2005). Within a study of 825 nationally representative school districts, approximately 35% had district-wide policies on sex education allowing only abstinence-focused sexuality education, and two-thirds of those school districts combined abstinence education with information on condom use and other contraceptives to prevent teen sexual activity and its consequences (Landry, et al., 1999).

While only a small amount of data detailing the effectiveness of these abstinence education programs exists at the present time, the knowledge base is growing (Khouzem, 1995; Howard & McCabe, 1990; *SIECUS*, 2004; Maynard et al., 2005). It is evident from evaluations that have been completed (Goodson, et al., in press; Devaney, et al., 2002; Maynard et al., 2005, among others), that most of the programs try to affect nonsexual antecedents of sexual behavior. Examples of these nonsexual variables

include attitudes, self-esteem, self-efficacy, and intention (Goodson, Pruitt, et al., 2003; Goodson et al., in press; Kirby, 1997; Toupes & Holmes, 2002). Many of these variables are conceptually linked to, or statistically moderate the construct of motivation.

The study of motivation to practice sexual abstinence is absent from the adolescent sexual behavior literature. Two separate comprehensive reviews -- describing sexual and non-sexual antecedents of adolescent sexual behavior -- (Kirby 1997; 2001) reported no published studies investigating motivation towards abstinent behavior, specifically. An electronic search of the peer-reviewed literature, using the search terms “motivation” and “abstinence” also yielded no published studies. Although limited investigations into the attitudes, beliefs and skills related to the postponement of sexual initiation have been preformed, *motivation for sexual abstinence per se* remains unstudied.

When exploring motivation for sexual abstinence, consideration must be given to the multidimensional nature of motivation. Ryan and Deci (2000) suggest that motivation is based on multiple factors, different experiences, and varied consequences and yet often treated as a single construct. Unidimensional measurement of a construct which has more than one underlying dimension can skew interpretation and minimize the meaningfulness of data, leading to erroneous conclusions (Ghiselli, Campbell & Zedeck, 1981). For example, a questionnaire asking two people to indicate how motivated they are to remain sexually abstinent that only yields one score could erroneously lead to the conclusion that they are equally motivated, or motivated for the same reason.

While it appears that in other disciplines such as education, sociology, and psychology, researchers are approaching motivation in a more multidimensional manner (Dowson & McInerney, 1997; Hwang, Echols, & Vrongistinos, 2002; Lawson, 2004), less attention has been devoted to this aspect of motivation within health education and health promotion. A recent review of the health behavior literature concerning motivation found little effort to explore the multi-dimensionality of the construct, as well as lack of consensus on the definition, measurement or indicators of motivation (Dunsmore & Goodson, manuscript under review). Exploration into the multi-dimensionality of motivation can provide researchers with a glimpse of the pattern or structure embedded within such a complex construct, which is imperative to the development of precise measures to evaluate these patterns in reference to healthy behavior (Shepard, 1972).

As previously mentioned, consistent and validated measurements of antecedents, specifically motivation, for sexual abstinence are missing from the literature. The importance of this present gap in the literature is emphasized further by the lack of methodological quality in *existing* measurements of antecedents for sexual abstinence and sexual activity. Measurement techniques in this subject area are often lacking in areas such as design, sampling, measurement and consistency (Kirby 2001; Smith et al., 2003). Addressing the measurement faults outlined by Smith et al. (2003), and adhering to proposed “gold standards” of measurement, will result in sound methods of measuring motivation for sexual abstinence.

In summary, the rationale for this study is twofold. First, an examination of the dimensions motivation for sexual abstinence will provide consumers of the sexual health literature a better understanding of sexually abstinent behavior of youth. Second, it is only through a structured conceptualization of the multidimensionality of motivation that researchers can begin to develop meaningful measures to effectively evaluate the impact motivation has on early sexual behavior. It is through this more comprehensive understanding of motivation for adolescent sexual abstinence, and a multidimensional tool to measure it that, perhaps, behavior change can be impacted in the future. Therefore, the purpose of this paper is to conceptualize the various dimensions of college students' motivation to remain sexually abstinent.

Concept Mapping

An understanding of the construct of motivation for sexual abstinence is imperative for gaining insight into abstinent behavior. Motivation, both as a general construct and specifically for sexually abstinent behavior, is not easily observed in others and therefore does not lend itself to simple conclusions regarding its components. Constructs which are not directly observable and are not constant are considered latent variables, suggesting they represent at least two indicators that exemplify their meaning (DeVellis, 2003; Tabachnick & Fidell, 2001).

Conceptualization, defined as the "...articulation of thoughts, ideas, or hunches and the representation of these in some objective form" (Trochim, 1989, p. 1), has recently been introduced as a method by which to structure underlying ideas surrounding

a complex construct such as motivation (Trochim & Linton, 1986). Concept mapping originated out of this need to organize ideas and visually represent it for others to see, specifically for planning and evaluation. According to Trochim and Linton (1986, p. 290), "...conceptualization methods are specifiable, definable processes which can be used to organize thinking and to represent it for others to see."

The construction of a "concept map" (Trochim, 1989) will be utilized within this study to represent an organized and interpretable arrangement of the dimensions of motivation -- a conceptualization of motivation for sexual abstinence. Valentine (1989) suggests that the concept mapping process serves to make complex human process concepts, such as motivation, clear through visual representations and the exploration of the interrelationships within this structured conceptualization can "...serve as the basis for questionnaire item development" (p. 18).

Typically, the concept mapping process occurs in six steps: (1) selecting participants for the brainstorming session and defining both the focus of the study and the rating scale); (2) having participants generate statements that apply to the concept in question; (3) structuring statements according to relatedness; (4) representing statements on various "concept maps"; (5) interpreting the maps; (6) and putting the information gained from the maps to use.

Methods

Design

This study utilized a mixture of quantitative and qualitative methods by way of the concept mapping technique as outlined by Trochim (1989). In-depth brainstorming sessions with college students were used to elicit statements regarding motivation for sexual abstinence. Following the group work, data obtained from the sample were analyzed using the Concept Systems® software, which subjected the qualitative data to multivariate analysis techniques such as cluster and multidimensional scaling analyses.

Participants

The population of interest for this study was students from two large universities in central Texas -- 15 students from one university (group 1) and 20 students from the other (group 2). Group 1 was comprised of students enrolled in four university-required health education classes during the second summer session in 2004. Group 2 was comprised of students enrolled in two elective health education classes during the fall semester of 2004. In both instances, the lead author recruited participants by visiting the classes and explaining the concept mapping activity and incentive, and gathering email addresses from those interested. A feasible date was selected for each group, and included in the email invitation sent to all email addresses. The two group meetings were held within 2 days of recruitment. A maximum of twenty students were allowed into each session (Trochim,1989).

Data Collection

Data were gathered in group meetings following procedures outlined in the concept mapping technique (Trochim, 1989; Trochim & Linton, 1986). To generate the conceptual domain, structured brainstorming was used to generate ideas regarding the dimensions of motivation to remain sexually abstinent (Dunn 1981; Trochim and Linton, 1986). To avoid semantic confusion regarding the topic, the authors first asked the participants to engage in an open dialogue concerning the definition of the word abstinence. Researchers defined sexual abstinence as the avoidance and restraint from sexual intercourse or other sexual acts considered to be precursors to sexual intercourse and/or the internalization of traits, skills or characteristics consistent with an abstinent life-style (Goodson, Suther, et al., 2003). Motivation was defined in this study as the processes through which behavior (in this case, abstinence from sexual activity) is energized and directed (Deci & Ryan, 1985).

Participants were then asked to generate statements based on the following brainstorming focus: “Generate statements about a) what motivates kids/young adults to avoid and restrain from sexual intercourse or other sexual acts considered to be precursors to sexual intercourse as well as b) what motivates kids/young adults to acquire and internalize the traits, skills or characteristics to live an abstinent lifestyle.” Authors acknowledge that this focus statement is double-barreled and, therefore, discouraged (Trochim, 1989), but the representation of both the positive and negative aspects of abstinent behavior (identified in a previous study of abstinence programs – by

Goodson et al., 2003) was essential in capturing all the dimensions of motivation for abstinent behavior.

Statements were recorded as they were generated to ensure that all participants could see the set of statements as it evolved. The total number of statement generated was limited to 100 to ensure manageability during the multivariate analyses (Trochim, 1989; Trochim & Linton, 1986). Once the final set of statements was generated, the group performed a final edit to ensure all ideas had been communicated and that the semantic representation was correct. Each statement, the smallest unit of distinguishable thought regarding the topic, is referred to as *entity* (Trochim & Linton, 1986). A total of 83 statements/entities were generated in group 1 and 90 in group 2 – and represent motivation for sexual abstinence according to this group.

To elicit interrelationships of the entities among the concept of motivation for sexual abstinence created by the statement list, the authors used the “unstructured sorting procedure” outlined by Rosenberg and Kim (1975). This process involved four steps: 1) each statement, or entity, generated in the final list was printed on a 3X5 index card, 2) each participant received a complete, printed set of 3X 5 cards containing all of the statements generated by his/her group (one statement per card), 3) participants were asked to go through and rate – by writing on each card – a number (between 1 and 5) representing “how motivating” they perceived that particular statement to be, where ‘1’ equaled “not motivating at all” and ‘5’ equaled “the most motivating” and 4) each participant was then asked to sort their stack of rated statement cards into piles that made conceptual sense to them. Restrictions for step four included: each individual statement

could only be placed in one pile (one statement could not exist simultaneously in two piles); all of the statements could not be put into only one pile; and all of the statements could not exist as their own piles (although sometimes it might be appropriate to have only one statement in a pile).

The organization of the *entities* into structured groups (the conceptual “piles”) provides what the literature refers to as *concepts*: either individual entities or groups of entities representing a specific topic. The arrangement of these concepts and entities for the motivation for sexual abstinence constitutes the conceptualization of the motivation for sexual abstinence construct (Trochim & Linton, 1986).

Data Analysis

Data were analyzed both quantitatively and qualitatively utilizing multivariate data analyses such as multidimensional scaling (MDS) (Davison, 1983; Kruskal & Wish, 1978) and cluster analysis (Anderberg, 1973; Everitt, 1980) to construct the idea maps using the Concept Systems® statistical software. At the completion of the two groups, the researchers had one packet of cards per participant, sorted into smaller “piles” by concept, all rated in terms of how motivating each statement was. The information for each participant was entered into the software to generate concept maps.

The concept maps display the entire statement list in a two dimensional (x, y) space that places similar entities closer together, and clusters general ideas (Trochim, 2004). The statistic often reported in the MDS analysis to denote the goodness-of-fit of the configuration is called the stress value, of which a lower number means a better fit.

Trochim (1993) reports the average stress value across 33 concept mapping projects is .285, ranging from .155 to .352. The stress value in this study was .270 for group 1, and .310 for group 2, both within the range of acceptable goodness-of-fit.

The Concept Systems® software utilizes hierarchical cluster analysis to define clusters (Trochim, 2004). Multi-dimensional scaling and cluster analysis provide the interpretable quantitative measurement of the common ideas gathered in the focus groups. The information generated in the MDS is partitioned into non-overlapping clusters by the cluster analysis, although the decision regarding the final number of clusters is made by the researcher. The literature and the software propose an initial 20 cluster solution, and direct each individual study to examine lower cluster solutions. As preservation of detail and provision of interpretable results should guide researchers in choosing the final number of clusters (Trochim, 2004), the authors decided upon a five-cluster solution for group 1 and a four-cluster solution for group 2.

Results

A total of 35 students participated in the concept mapping process, 22 of whom were female (62%). Ages of the participants ranged from 19 to 23, with 40% being 20-year-olds. The ethnic make-up of the participants was primarily Caucasian (74%), followed by Asians (14%) and Hispanics (5%).

Interpretation of Concept Maps

The point-cluster rating map (see Figures 1 & 2) shows all of the statements in relation to each other according to the MDS. These figures also display the average rating of each cluster for each respective group of participants, with the number of layers for each cluster indicating the average “motivation” rating for that cluster.

The cluster set for group 1 (Figure 1) was identified as: (1) Future Orientation; (2) Positive Outcomes/Aspects of Abstinence; (3) Religion; (4) Fear of Physical/Sexual Relationship; (5) Concerns Related to Social Responsibility. The Religion cluster had the highest rating (mean=4.03) (Table 1), indicating it was the most motivating cluster while the Positive Outcomes/Aspects of Abstinence cluster had the lowest rating (mean=3.33) indicating group 1 considered this the least motivating factor.

Table 1

Statements/entities generated by two groups of college students (through Concept Mapping strategies) regarding motivation for sexual abstinence. Only average ratings of 3.0 or higher are shown.

<i>Statement/entity</i>	<i>rating</i>
<u>Future Orientation (Group 1)</u>	
Potential guilt of dealing with consequences	4.00
Want to wait for love...	3.87
Perceiving one's self as being "worth the wait"...	3.87
Sharing a similar past sex life with future partner	3.87
Commitment to future mate	3.87
Waiting for true intimacy that comes with marriage	3.80
"Specialness" of marriage	3.60
Maintaining your "value" for an abstinent partner	3.47
Expectations for marriage	3.47
If partner is waiting, why shouldn't I also wait?	3.20
Average rating= 3.70	
<u>Positive Outcomes/Positive Aspect of Abstinence (Group 1)</u>	
Responsibility with self	3.87
One less stressor in life...	3.67
Sense of pride (better than others; better able to "resist")	3.67
Determining that one is not ready (maturity-wise)	3.53
Because one wants to	3.40
Increases self worth; self-esteem	3.40
Overall happiness	3.27
Focus on careers	3.13
One way to demonstrate that you're strong willed	3.07
Wanting to be different / better	3.07
Concentrating on work and life, no distractions	3.00
Average rating= 3.37	
<u>Religion (Groups 1 & 2)</u>	
Fear of God.	4.67
Commitment to God.	4.33
Biblical doctrine: sin	4.20
Exposure to abstinence as a value.	4.20
Religious views of marriage	4.20
Biblical doctrines (Christianity: body as temple...)	4.13
Responsibility with God	4.13
Making a sacrifice as a religious value (the attainment of something "higher")	4.07
Societal/ religious views of sex outside marriage as wrong.	3.80
Worry about disappointing your church family	3.60
Having to confess to priest or church family	3.60
Fear of committing adultery	3.13
Commitment to God	4.65
Only have one chance to give virginity away-make it right	4.45
Waiting to become one person with husband (physically)	4.35
Want to remember it being with someone you loved	4.35
Commitment to spouse and kids	4.30
Waiting to become one person with husband (emotionally)	4.30
Moral convictions	4.20
Obtain purity	4.05
You are treasured more (as a virgin)	4.00
Wanting to give virginity as a gift on wedding day	3.95

Table 1 Continued

<i>Statement/entity</i>	<i>rating</i>
Virginity maintains respect	3.80
Fear of getting the “end prize” then losing interest in the relationship	3.65
Not wanting intimacy/attachment without promise of always being there	3.60
Not wanting to bring in baggage to future relationship	3.50
Girls-not wanting to ruin image of walking down isle in a pure “white dress”	3.50
Not wanting to rush relationship	3.45
Not wanting to have to talk about “baggage” with future spouse	3.40
Men-finding the “one” and showing that he will wait for her	3.35
Not wanting to carry guilt from ruining that day	3.20

Average rating=3.91

Fear of Physical/Sexual Relationship (Groups 1 & 2)

Embarrassment about body	3.55
Body image	3.30
Fear of unknown (actual act)	3.00
Scared to show body	3.10
Fear of being compared to others	3.05
Fear of pregnancy	4.53
Females have more to lose if pregnant.	4.27
Fear of STDs	4.13
Females have to worry about pregnancy and rearing child itself	4.13
Not wanting the consequences observed in other people’s lives	4.00
Regret: you can’t take it back	4.00
Scared of one’s performance being compared with others’	3.91
Intimidating options/consequences: giving child for adoption; abortion	3.93
Fear of being naked in front of someone else.	3.60
Fear of not knowing how to perform	3.53
Embarrassment about one own’s body	3.40
Fear of having to marry the girl if girl is pregnant	3.33
Fear of attachment	3.27
Freedom from comparisons with other people’s sexual performance	3.27
Fear of having to have an abortion (females)	3.27
Fear of the unknown...	3.20
Fear of financial obligations of pregnancy for males	3.20
Fear of commitment	3.20
Fear due to lack of knowledge	3.13
Fear of losing partner’s respect	3.07
Fear of losing partner	3.00
Fear of meeting stereotypical expectations	3.00

Average rating= 3.49

Concerns Related to Social Responsibility (Group 1)

Responsibility with parents	4.07
Peer influence: if peers are abstinent or if peers are sexually active	4.00
Worry about how your parents will think of you	3.93
Fear of disappointing parents	3.93
Fear of parents finding out	3.93
Worry about going against family’s mores (religious or cultural)	3.80
Fear of damaged reputation	3.80
Commitment to friends	3.60
Be a role model	3.47
Worry about what peers will think of you if you had sex	3.47
Being a role model for siblings	3.40

Table 1 Continued

<u>Statement/entity</u>	<u>rating</u>
Desire to please parents.	3.40
Cultural values...	3.40
Guys value “virgins” more than...	3.33
Could come back to “haunt” you (modeling behavior for future children)	3.27
Being a role model as educators... (walking the talk)	3.20
Fear of being rejected – sent away (females)	3.13

Average rating=3.59

Fear of Emotional/Moral Consequences (Group 2)

Fear of regret	4.25
Fear of having a child and that ruining freedom	3.80
Fear of guilt	3.80
Worry about partner leaving after getting “the prize”	3.75
Losing respect of self	3.70
Losing respect of partner	3.65
Avoiding a bad reputation	3.50
Self-respect	3.50
Fear of it changing the rest of your life	3.45
Fear of commitment	3.40
Avoid being a slut	3.35
Fear that once virginity is gone, that they will be taken advantage of	3.25
Fear of being alienated/treated like trash for having sex	3.25
Fear of instability	3.10

Average rating=3.55

Fear of Physical Consequences (Group 2)

Fear of pregnancy	4.80
Only true protection from pregnancy	4.15
Only true protection from STI	4.10
Fear of family rejection	4.05
Worry about protection (birth control and STI)	3.80
Fear of partner having a disease	3.80
What society’s image of you if pregnant	3.70
Seen consequences of someone suffering negative effects of sex (pregnancy)	3.55
Not wanting to have to make the decision of whether to abort or not	3.55
Worrying about person’s past	3.35
Fear of friend rejection	3.30
Scared of disappointing parents	3.30
Wanting to gain parental approval	3.25
What society’s image is of you if you have disease	3.25
Fear of partner lying about past (# of partners)	3.20
If you have a disease, not wanting to pass it on	3.15
Fitting in with what friends do (abstain)	3.00

Average rating=3.60

Control/Manipulation (sub-cluster created by authors) (Group 2)

Girls- wanting to be chased- keep them wanting more	3.40
Virginity as a control tool	3.15
*Playing hard to get	2.95
*Use as a manipulation tool (virginity or sex)	2.95

Average rating= 3.11

***These statements (despite lower rating) were included for exploration into the Control/Manipulation cluster added by authors.**

The cluster set for group 2 (Figure 2) was identified as: (1) Fear of Emotional/Moral Consequences; (2) Religion; (3) Fear of Physical/Sexual Relationship; (4) Fear of Physical Consequences. The Religion cluster also had the highest rating (mean=3.85) (Table 1), or was the most motivating to this group, while the Fear of Physical/Sexual Relationship cluster had the lowest rating (mean=2.42).

Within group 2, the following statements sub-clustered together within the Fear of Emotional/Moral Consequences cluster: “females want to be chased and keep males wanting more;” “virginity as a control tool;” “be an example;” “playing hard to get;” and “use as a manipulation tool (virginity or sex).” Because all of these statements referred to using sexual abstinence as a control tool, we decided to place them in a separate cluster for further examination.

Themes Common to Both Samples

The Religion cluster was present in both samples, although the wording of the statements varied between the two groups. Although some semantic differences existed, common themes included commitment to God, religious views of marriage, societal/religious views of sex outside marriage as being wrong, and moral convictions.

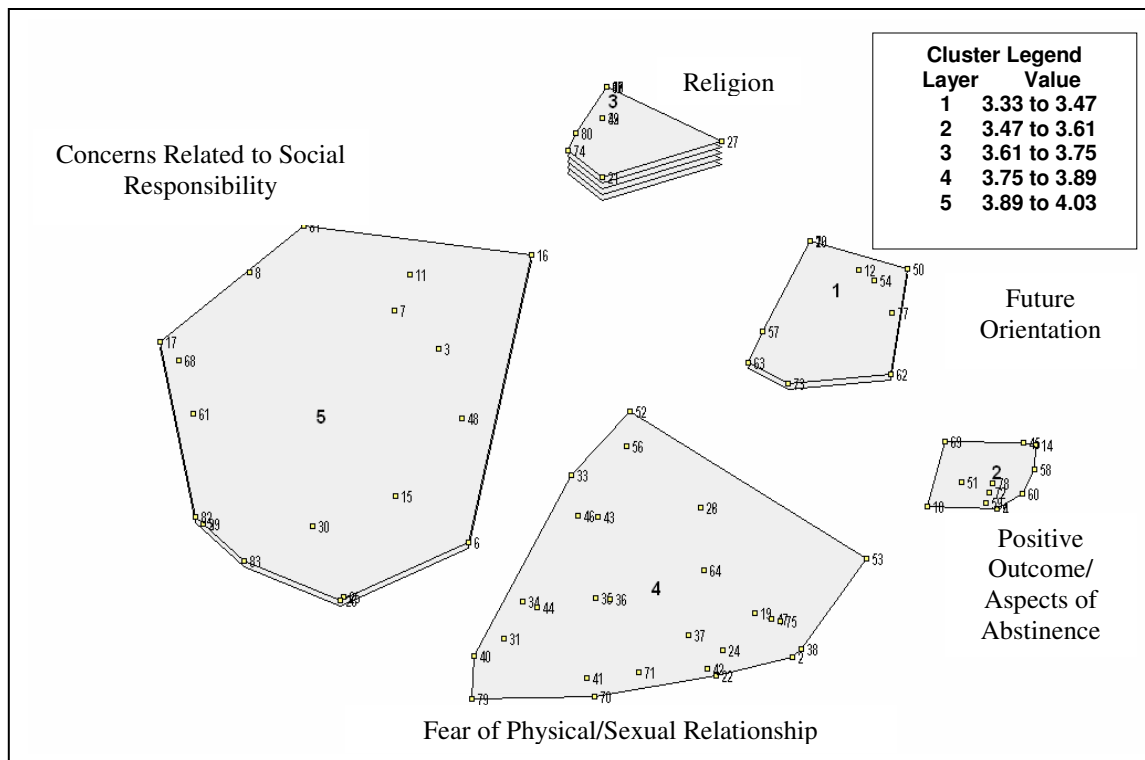


Figure 1. Cluster rating map from group 1 sample showing the multidimensional scaling arrangement of the 83 statements with the five-cluster solution and the average cluster rating for the motivation variable.

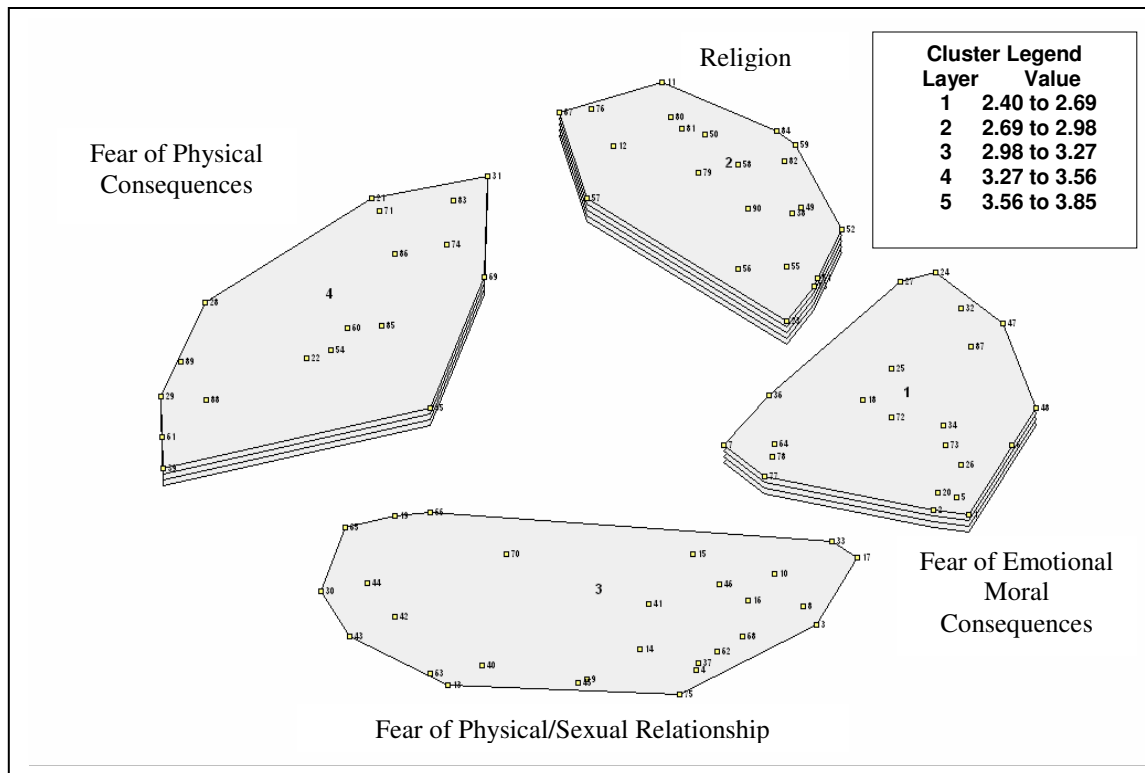


Figure 2. Cluster rating map from group 2 sample showing the multidimensional scaling arrangement of the 90 statements with the five-cluster solution and the average cluster rating for the motivation variable.

The Fear of the Physical/Sexual Relationship cluster also emerged in both samples. Statements included in this cluster varied somewhat between the two schools, but focused on the apprehension associated with the physical sexual encounter. For example, “I feel embarrassed to show my body,” “I fear that I don’t know how to perform,” and “I am afraid of being compared to somebody else regarding sexual performance” are entities included in these clusters.

When asked how “motivating” each statement was to remaining sexually abstinent, the top three rated entities among both samples were “Fear of pregnancy”, “Fear of God”, and “Commitment to God” (Table 1). “Fear of Pregnancy” represented the most motivating statement (4.80 -- highest rating in group 2; 4.53 – second highest rating in group 1).

Both groups mentioned fears/concerns about pregnancy more often than fears/concerns regarding sexually transmitted diseases/infections (STIs). Within group 1, one statement of fear toward an STI was mentioned (motivation rating of 4.13), while seven statements describing fears of pregnancy or having to make a choice concerning a pregnancy (average motivation rating = 3.80) were mentioned. Group 2 also mentioned concerns about pregnancy or having to make a choice concerning a pregnancy more often with eight statements (average motivation rating = 3.53), and only six statements expressing fear/concern about an STI (average motivation rating 3.36).

A combination of *fear of disappointing parents* by becoming sexually active and a *desire to please parents* by remaining abstinent was voiced as a significant concern among both groups. Group 1 generated six different statements, all with motivation ratings above 3.40 (mean=3.84), such as, “I fear disappointing my parents” and “I have a desire to please my parents.” Group 2 generated three similar statements – “I fear family rejection,” “I am scared of disappointing my parents,” and “I want to gain parental approval.” The mean rating of parental statements in group 2 was 3.53, denoting this as a motivating influence based on the five point Likert scale used.

Discussion

This study represents an attempt to uncover the various dimensions of motivation for sexual activity through a detailed conceptualization process carried out with young college students. Based on the information gained from this process, seven distinct dimensions have emerged as possible indicators of motivation for sexual abstinence: Religion, Fear of Physical/Sexual Relationship, Future Orientation, Positive Outcomes/Positive Aspect of Abstinence, Concerns Related to Social Responsibility, Fear of Emotional/Moral Consequences, and Fear of Physical Consequences.

The two most stable dimensions appear to be Religion and Fear of Physical/Sexual Relationship, considering that they appeared in both groups. Adding to its stability, the Religion dimension was rated the most motivating by both groups. Attachment to a religious community is described by Kirby (2001) as being a protective factor for an adolescent's decision to engage in sexual activity. Our data confirm religion as a protective factor, considering its high motivation for sexual abstinence rating. Although examination into which aspects or dimensions of religion were the most motivating was beyond the scope of this study, we suggest that further research concentrate on both the causal and reciprocal relationships between the various aspects of religion as a motivator and adolescent sexual behavior.

While the Religion cluster had the highest rating within both groups indicating that it was the most motivating cluster, the Positive Outcomes/Aspects of Abstinence category had the lowest rating within group 1 and did not emerge as a cluster in group 2 - suggesting its less significant role in motivation. This finding prompts further

investigation into the effectiveness of abstinence programs that use this element as a teaching tactic. Many abstinence education programs use a "...proactive stance, highlighting specific attitudes and behaviors that must be internalized, incorporated, and practiced by youth to be characterized as an abstinent lifestyle..." (Goodson, Suther, et al., 2003, p. 92). It is intriguing that positive aspects of abstinence did not emerge within this study as a highly motivating factor – a finding that needs to be considered because currently funded abstinence programs are emphasizing this aspect. The question remains whether these programs will be effective, and if left as they are – can they assist in uplifting the importance of this dimension?

Intention has been identified as one of the top three factors that influence health behavior change (Fishebein et al., 1991) as well as a significant nonsexual antecedent in sexual behavior choices (Goodson et al., manuscript in press; Kirby, 1997; Toupes & Holmes, 2002). According to conclusions drawn at a theorists workshop, Fishbein et al. (1991) describe intention as being affected by five factors when making a behavior choice: perceived benefit, perceived social norm, perceived self-efficacy, perceived consistency with self-standards, and emotional reaction. Items within the Future Orientation cluster correspond to these factors, further validating this cluster as important for abstinent behavior. For example, an adolescent is more likely to intend to remain sexually abstinent if he/she believes that the benefits of waiting for the future outweigh the costs ("I am waiting for the true intimacy that comes with marriage"), believes that important people such as the person he/she will be marrying feels the same way ("If my partner is waiting, why shouldn't I also wait?"), feels that abstinence is

consistent with who he/she is, according to self-standards (“I feel I am worth the wait”), and wants to avoid a negative emotional reaction (“I want to avoid the potential guilt of dealing with the consequences of sex”). The development of educational programs should focus on these factors given the theoretical and empirical support they enjoy.

As mentioned in the findings, the most motivating entity for sexual abstinence among this sample of adolescents was “Fear of pregnancy”, validating a previous study by Kahn et al. (2004) which also found avoidance of pregnancy to be the most important reason for postponing sexual initiation among both adolescent boys and girls. In the same study (Kahn et al., 2004), lack of knowledge about birth control was revealed as the least important reason for postponing sex. Similarly within our study, only two statements of concerns regarding contraception were listed in the entire set for both groups, demonstrating that distress surrounding issues of protection were not considered a motivating factor by our sample. Given these results, the following question is raised: what is the relationship between fear of pregnancy, which emerged as a motivating factor for abstinent behavior, and concern about contraception, which did not? Does the lack of voiced apprehension surrounding contraception in both this study and others suggest that adolescents view methods of birth control as not being important in their decision to initiate sex? Could the absence of this concept indicate a high level confidence in the effectiveness of contraception, which might, in turn, impede abstinent behavior? Answers to these questions can only be ascertained through further investigation.

Fears and concerns of a physical nature appear to be a significant issue for motivation for sexual abstinence, according to both groups within our study. Issues such as fear of showing one's body, fear of being compared to someone else's performance, or not knowing how to perform describe the type of concern this group had concerning the actual physical element of sex. The presence of such fear among college students may indicate that they have not been exposed to adequate teaching/programming regarding healthy sexual relationships and/or healthy sexuality. Wilson et al. (2005), in fact, identified a very small number of abstinence curricula focusing on the topics of healthy sexuality in a review of 21 curricula for abstinence-only-until-marriage programs. According to these results, fear of sexuality and/or the sexual relationship is indeed a dimension of motivation for sexual abstinence; one that perhaps could be problematic for the future sexual health of these adolescents. By addressing healthy sexuality/sexual relationships in abstinence education programs, can these fears be calmed – thus promoting a healthier view of sexuality?

Results regarding the influence of parents on motivation for abstinence within this study confirm findings in the literature that explain parental influence as being a major contributor to adolescents' sexual activity choices (Jaccard, Dittus, & Gordon, 1996; Kahn et al, 2004; Kirby, 2001; Miller, et al., 1998). For example, Kahn et al. (2004) found perceived parental beliefs about sexual activity to be the fourth most important reason for postponing sexual initiation, a finding very similar to the high motivational ranking this study found for parental influence. Although Kirby (2001) found parent-child communication regarding sexual activity to be mixed as both a

protective factor and a risk factor, he did explain that parental modeling of promiscuous sexual behavior and expression of values consistent with sexual risk taking are related to teen behavior.

The statements generated by our study indicated that participants felt that by having sex they would disappoint their parents, and conversely, they would gain approval through abstinent behavior. Perhaps the values expressed and behavior modeled by this sample's parents were those conducive to the promotion of abstinence, and the views of their children followed suit. Further investigation into the level of parent-child communication, modeling behaviors and expressed values of the parents of this sample would provide even more compelling results regarding the relationship of parental influence on abstinent behavior.

Kirby (2001) explained that adolescents' beliefs, attitudes and skills are perhaps the most strongly related antecedents to sexual behavior. It appears that in reference to antecedents to sexually *abstinent* behavior, these psychosocial factors may be equally important. Within this study, many entities/statements representing participants' beliefs, attitudes, and skills emerged as motivators for sexually abstinent behavior such as: perceived personal and social cost/benefit of abstinence; expected roles; belief in losing respect if sexually active; feelings of guilt; and greater self-efficacy to refrain.

Limitations

Characteristics inherent to the Concept Systems® software did not allow us to add samples beyond what we are presenting. Second, an update in the software midway through the study by Concept Systems Inc. introduced considerable time constraints and uncertainty due to the discontinuation of an instruction manual. In addition, the software license would not allow us to pool/aggregate the two statement lists generated from our two samples, causing the loss of information that could have been gained from the combination of the two maps. As the external validity of our findings need to be established by other researchers in the field, this may be problematic because the replicability of our study could be hampered by these software problems.

Another limitation of this study involves the homogeneity of the sample, which may have biased the statements generated in the concept mapping process. The two universities taking part in this study are located in central Texas, yielding participants that do not nationally represent the views of adolescents, limiting the generalizations that can be drawn from our results. The participants in this study were primarily Caucasian females – which also could bias results. Replication of this study with a more diverse sample may yield different dimensions of motivation.

Nevertheless, findings from this study have tremendous potential with further application and investigation. Although the study is limited, it contributes valuable base-line data for the further development and refinement of measures that generate valid and reliable data on young people's motivation for sexual abstinence. In addition, the elements necessary to begin exploration into a theory of motivation for sexual

abstinence now exist, based on these results. This preliminary investigation of the various dimensions of motivation for sexual abstinence represents a first step in gaining an applicable understanding of this construct and the various contributions possible in further research.

CHAPTER III

INSTRUMENT DEVELOPMENT AND TESTING

Introduction and Purpose

The purpose of this study was to design and test a multidimensional scale to measure adolescents' and young adults' motivation to remain sexually abstinent. In an initial attempt to investigate the structure behind motivation to practice sexual abstinence, preliminary dimensions of motivation uncovered in a previous qualitative study (Dunsmore & Goodson, unpublished manuscript) were used to construct the Sexual Abstinence Motivation Scale (SAMS) and subjected to exploratory factor analysis. The instrument was psychometrically tested on a sample of undergraduate students in order to check the reliability and validity of the data.

Much of adolescent sexuality research has focused on unhealthy adolescent sexual behavior as a significant area of concern due to the many adverse physical, psychological, and social consequences (Aggleton, 1995; Goodson et al., article in press; Grunbaum et al., 2002; Kirby, 2002; Kotchick, Shaffer & Forehand, 2001). In an effort to understand the causes of adolescent sexual behavior and identify specific groups who are at risk for these consequences, various determinants, or antecedents, have been examined. Psychosocial antecedents such as attitudes, skills, and beliefs have emerged as being most strongly related to sexual behavior and as the cornerstone of the most successful interventions to prevent such activity thus far (Kirby, 2001). A detailed examination of these psychosocial antecedents is imperative for gaining a deeper

understanding of adolescent sexual activity, identifying specific groups who are prone to unhealthy sexual behavior, and developing more effective interventions to deter early initiation (Kahn, et al., 2004; Kirby 1997, 2001).

Perhaps the central question surrounding efforts to identify determinants of adolescent sexual behavior is *what is causing or directing adolescents to engage in sexual activity?* Defined as the processes through which behavior is directed and energized (Deci & Ryan, 1985), motivation is an essential component of what causes or directs healthy behavior choices – specifically adolescent sexual activity choices (Dunsmore and Goodson, unpublished manuscript, 2005; Gebhardt & Maes, 2001; Ryan & Deci, 2000). Motivation is described as the “why” of behavior (Haber, 1966). Motivation is regarded as the basis of self-regulation and is able to cause individuals to act or refrain from action (Ryan & Deci, 2000). Many of the psychosocial antecedents of adolescent sexual behavior such as beliefs, values, and intentions, (Kirby 1997, 2001), have been conceptually linked to the construct of motivation (Dunsmore & Goodson, manuscript under review).

While the factors that direct, or motivate, engagement in *sexual activity* are often examined by researchers, a discussion of the motivation behind *sexual abstinence* is absent (Dunsmore & Goodson, unpublished manuscript, 2005; Kirby 1997, 2001). Reduction of adolescent sexual activity and the promotion of abstinent behavior are two themes within the adolescent sexual behavior literature aimed at promoting healthy behavior choices (Basen-Enquist & Parcel, 1992; Brewster, Billy & Grady, 1993; Card et al., 1996; Christopher & Roosa, 1990; Koo et al., 1994; Luster & Small, 1994;

Landry, Kaeser, & Richards, 1999; Maynard et al., 2005). Despite the role abstinence may play in the adolescent sexual activity equation, studies that question what motivates *abstinent behavior* are missing (Dunsmore & Goodson, unpublished manuscript).

A detailed examination, therefore, into this psychosocial antecedent of adolescent sexual behavior – *motivation* – could provide health behavior researchers with a detailed understanding of one of the influential forces on decisions about adolescent sexual activity, specifically the decision to remain abstinent. An understanding of the motivation behind sexually abstinent behavior among adolescents could be useful to abstinence education efforts, one of the most visible solutions to the consequences of early sexual initiation.

The Measurement of Sexual Abstinence

Although sexual abstinence is being discussed in the sexuality literature, current measures only address *reasons* for and *attitudes* concerning the decision not to engage in sexual activity – not motivation. Loewenson and colleagues (2003) examined *reasons for* abstinence such as fear of adverse consequences, perception of peer's normative behavior, and perception of the benefits to waiting (Loewenson et al., 2004). The Sexual Ideology Instrument (SII) provides measurement of *attitudes toward* the sexual abstinence (Lottes, 1983a; 1983b; 1998). In accordance with suggestions offered by Ghiselli, Campbell, & Zedeck (1981), it is imperative to first specify and define a construct of interest in order to accurately measure it. Reasons, attitudes and motivation

are all different constructs with varying definitions, warranting psychometric exploration specifically of *motivation* for sexual abstinence.

While a scale for measuring motivation to engage in *sexual activity* is available (Quadagno, 1998), it may be incorrect to assume that this tool will also be able to measure the factors motivating adolescents to remain *sexually abstinent*. Engagement in sexual activity and the practice of sexual abstinence are distinct behaviors, requiring different measurements. For example, although the existing scale (the Age, Gender, and Sexual Motivation Inventory -- AGSMI) (Quadagno, 1998) addresses several dimensions of motivation for sexual activity (physical, emotional, and fear of relationship status with partner), it fails to address potential dimensions such as fear of pregnancy, positive view of abstinence, religious beliefs, and other dimensions of motivation, specifically related to sexual abstinence (Dunsmore & Goodson, unpublished manuscript).

The characteristic of being “motivated” is not directly observable and is not constant; therefore, motivation is considered a latent variable – a construct defined through inference (DeVellis, 2003). Ghiselli et al. (1981) explains that inferences about intangible constructs such as motivation are accomplished through approximations and indirect measurement using multiple questions. The magnitude of these measures, or factors, is caused by an underlying construct -- in this case motivation -- and is often examined through a scale (DeVellis, 2003; Stevens, 1996).

Psychometrics, originating from the fields of psychology and education, has historically been utilized in the construction of multi-item health measurement tools

(Wright & Feinstein, 1992). This methodology includes the development of homogenous scales that collectively measure a single characteristic or attribute, and the exploration of relationships among factors through mathematical procedures (Marx et al., 1999). The development of an instrument to measure a psychological construct with multiple dimensions such as motivation hinges on this deductive process in order to uncover the pattern of correlations among factors/dimensions (Stevens, 1986).

Measurement instruments must yield consistent data because reliability ensures reduced random measurement error (Nunnally, 1978). The degree of self-consistency among the scores earned by the individual, or reliability of the measure, is considered one of the fundamental problems in measuring psychological variables such as motivation (Ghiselli, 1964). Scores without reliability are not valuable when predicting types of behavior, comparing various traits of an individual, assessing performance, or comparing individuals on the same test (Ghiselli, 1964).

Multidimensional scale development demands attention to the homogeneity of the items (DeVellis, 2003). One method of assessing this homogeneity, or whether items are measuring the same construct, is through the computation of Cronbach's alpha (Smith et al., 2003). DeVellis (2003) states that high internal consistency of items indicates measurement of a common cause, in this case – motivation for sexual abstinence.

Upon assessing internal consistency, examination into the various factors, or dimensions, of a multidimensional scale is optimal (DeVellis, 2003). Because each dimension represents an estimation of individual item scores within that factor (serving

as a scale in itself), the level of consistency within the factor must be evaluated.

Estimated scores on factors for individuals are more reliable than scores on individually observed variables, improving the measurement of the construct (Tabachnick & Fidell, 2001).

Validity of scores is necessary for an instrument to be useful. Instruments are evaluated based on whether they are capable of generating valid scores, while scores are evaluated based on the truth/validity of the data (Thompson, 2003; 2004). Valid scores provide assurance that scores from a measurement tool measure what it is intended to be measured (Thompson, 2003). Based on the definition of the characteristic being measured, validity is the amount of correspondence between the properties being measured within the instrument and the characteristic itself (Ghiselli, 1964; 1981). A panel of experts on the instrument topic is useful within survey construction, to assess whether items are measuring what they are supposed to be measuring, or establishing content validity (Smith et al., 2003).

Yet another method of diagnosing whether the data are valid is through factor analysis, where patterns of responses are explored through the creation of factors (Smith et al., 2003). In the century since its conception, the method of factor analysis has evolved into two distinct classes: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Thompson, 2004). EFA represents the procedures first introduced by Spearman (1904): a pure and simple exploration into the possible factors surrounding a construct without *a priori* expectations. More recently, CFA has emerged as a way of confirming expectations regarding the number of factors surrounding a

construct, the specific variables that are comprised within each factor, and the correlation of the factors with regard to theory (Joreskog, 1969; Thompson, 2004). EFA is considered appropriate to determine underlying structures of factors without expectations or theory, and has even be categorized as the preferred method due to the rigorous replication of its tests (Saucier & Goldberg, 1996; Thompson, 2004).

Factor analysis is useful to empirically determine how many latent variables, or factors, exist within a given set of items intended to measure one overall construct. Two empirical approaches exist: principal components analysis (PCA) and common factor analysis (DeVellis, 2003; Stevens, 1986). The linear combination (or weighted sum) of items into factors is present in both procedures with the goal of explaining variation and defining the content or meaning of these variables through pattern correlations in reference to the larger set of items (Stevens, 1986; Tabachnick & Fidell, 2001). The advantage of using PCA involves transforming the original variables *into* the linear components (principal components) while common factor analysis only permits an estimation of the factors, or development of a hypothetical scenario (DeVellis, 2003; Stevens, 1986; Tabachnick & Fidell, 2001). Components are defined and determined by the actual scores obtained on items, and not simply an idealized estimation.

When developing a questionnaire to measure motivation for sexual abstinence, caution must be exercised in order to yield a measurement tool that contributes specifically to the literature. In an attempt to improve measurement in the field of sexual abstinence, Smith et al. (2003) explain a set of standards necessary for quality research using self-report measures. Identification and isolation of the gradual development of

sexual identity by controlling for maturation is essential, especially when studying young people. The authors also advise aiming for high-quality scale construction demonstrating a clear link between survey items and the intended construct, pilot testing of the instrument, and assessment of internal consistency and validity. Avoiding misinterpretation on the part of the participant is also important, which can be accomplished by clear and explicit wording. Finally, Smith and colleagues recommend limiting social desirability bias by ensuring anonymity as well as entering the subscale scores of all respondents into the final analysis as a control variable (Smith et al. 2003). Through the application of these criteria for quality scale construction and rigorous psychometric testing, our aim was to design and test a multidimensional scale to measure adolescents' and young adults' motivation to remain sexually abstinent.

Methods

Design

The construction and testing of the Sexual Abstinence Motivation Scale (SAMS) used a mixed methods approach (Green & Caracelli, 1997) and was conducted in two phases. In the first phase (reported elsewhere, see Dunsmore and Goodson, unpublished manuscript) the authors used concept mapping (Trochim, 1986) to uncover nine dimensions of motivation for sexual abstinence among 2 groups of undergraduate students. The second phase – reported here - represents utilization of those nine dimensions to construct and test one comprehensive scale representing the various aspects of motivation for sexual abstinence.

An initial draft of the scale was reviewed by a panel of experts for content validity. A pilot stage of this study involved testing the preliminary instrument with a volunteer sample of students from each of the schools used in the previous concept mapping study. Convergent/discriminant validity of the data was tested with the Sexual Ideology Instrument (Lottes, 1983a; 1983b; 1998), and principal components factor analysis (PCA) examined the factor structure of the preliminary scale. The computation of a coefficient alpha was performed to assess internal consistency of the scores in each of the factors. A final draft of the SAMS was completed based on results from this pilot stage. The final version of the instrument was administered to a statistically representative sample of first year undergraduates enrolled in the same schools participating in the concept mapping (and pilot) study. All methods of analysis used in the pilot-testing of the instrument were replicated with the final, statistically representative sample.

Questionnaire Development

Nine specific clusters (dimensions) of motivation for sexual abstinence were identified in the previous concept mapping study: Religion, Fear of Physical/Sexual Relationship, Future Orientation, Positive Outcomes/Positive Aspect of Abstinence, Concerns Related to Social Responsibility, Fear of Emotional/Moral Consequences, and Fear of Physical Consequences (Dunsmore & Goodson, unpublished manuscript). Statements within each cluster were rated by participants in the concept mapping stage, according to how motivating they were for sexual abstinence, measured with a five point

Likert-type scale (1=not motivating; 2=fairly motivating; 3=moderately motivating; 4=very motivating; 5=extremely motivating).

Later, statements were selected for the SAMS from each of the nine clusters in an attempt to represent each of the dimensions of motivation. Statements that were representative of the type of motivation within the cluster *and* had a high rating (3.0 or greater - indicating that they were more motivating) were selected. Authors chose three to five of these statements, from each cluster. Each section of the SAMS represents one of the concept map clusters from the earlier concept mapping study (with the exception of the Control/Manipulation cluster and the Amotivation cluster, each added by the authors) (Dunsmore & Goodson, unpublished manuscript).

The preliminary version of the SAMS resulted in 42 items measuring the nine different dimensions. Items were presented to respondents in random order, not categorized by dimension. The scale was organized as a Likert-type measure, with the intent that participants would rate how motivating each statement was for their own sexually abstinent behavior on a scale of 1-5 (1=not motivating at all; 5=extremely motivating). Moreover, participants were also asked to rate how motivating they thought the statement was for today's teens. The instrument, thus formatted, assessed two distinct variables: personal motivation and perceived motivation of today's teenagers. The perceived motivation of today's teenagers variable was added as an additional test of the validity of personal motivation data. Given that it is reasonable to expect that one's own motivation for sexual abstinence will differ from one's perceptions of what

might motivate today's teenagers, including this additional measure was a way to test whether the items were measuring valid data.

The SAMS was designed to be Web-based. According to Kiernan et al. (2005), Web surveys appear to be as effective as mail surveys in the quantitative assessment of attitudes, knowledge, intentions, and behaviors. The feasibility of administering the SAMS via the Web enhanced the quality of our methods.

Clear and precise definitions and description of terms were included in the directions for the SAMS in order to avoid misinterpretation of questions. Sexual activity was defined as "participation in vaginal, oral or anal intercourse." Sexual abstinence was defined as "to avoid and restrain from sexual intercourse or other sexual acts that may lead to sexual intercourse." Sexually transmitted infection (STI) was defined as "diseases that are commonly transmitted between partners through some form of sexual activity, most commonly vaginal intercourse, oral sex, or anal sex (ie. HIV, chlamydia, syphilis)." Partner was defined as "the person with whom you (within the situation being presented in the statement) would/will be sexually active."

Demographic questions included age, gender, ethnic origin, program of study, classification, religious affiliation, and a question regarding present sexual activity status. A follow-up question for individuals who answered that they were presently abstinent (never had sexual intercourse or had had sex in the past and had recommitted to remaining abstinent until a specified time in the future) was included to assess their motivation for this decision. Answer options included all 42 items previously rated on the SAMS.

Participants

College students at two large universities (school 1 and school 2) in central Texas were the population of interest in this study – 72 participants for the pilot stage (73% response rate) and 1,410 participants for the final stage (14% response rate). Pilot stage participants were undergraduate students enrolled in 7 university-required classes during the summer session in 2005. Participants in the final stage were first-year students with active email accounts in the summer of 2005. According to Dillman (2000), a sample size of 965 is needed to statistically represent the first-year population size of 10,330 at the two universities used in this study with 3% error and a conservative 50/50 split.

Data Collection

Data were gathered in two stages: the pilot stage and the final stage. In the pilot stage, participants were recruited by the lead author visiting undergraduate classes at both schools in the summer of 2005 and gathering email addresses of interested students (N=98). For the final stage, the computer information service departments at each school were used to generate the list of freshman university students' email addresses (N=10,330). The SAMS was posted on an invitation-only website. In both the pilot and final stages, students were emailed an invitation containing a link to the final questionnaire and an explanation of the incentive, as well as reminder after 7 days (Dillman, 2000). Anonymity was assured on the invitation email, as well as on the information page at the beginning of the survey. All stages of this study were approved by the Institutional Review Boards of both participating schools.

Data Analysis

Data from the pilot stage and the final stage were analyzed separately, using the statistical software package SPSS® - version 13. All of the analyses run on the pilot stage data were re-run on the revised instrument with the final, statistically representative sample. In both stages, data were subjected to preliminary analyses to screen for outliers, check for multivariate normality, and for linearity. Exploratory factor analysis was then employed to (a) assess the factorial structure of the SAMS, (b) determine the number of latent variables (or factors) that characterized the set of items in the instrument, and (c) compare resulting factors with the factors generated from the previous concept mapping study (Dunsmore & Goodson, unpublished manuscript). Principal components analysis (PCA) was utilized to extract the maximum amount of variance from the data through linear combinations (weighted sums) of the items' scores (Tabachnick & Fidell, 2001; Stevens, 1996). An orthogonal rotation was then preformed on the data to improve the interpretability and utility of the solution (Tabachnick & Fidell, 2001), specifically the Varimax rotation.

In order to diagnose the data's validity, two categories were examined: criterion and content validity. Criterion validity (specifically discriminant/convergent validity) of the SAMS scores were tested through comparison with the three tenets of the Sexual Ideology Instrument (SII) (Lottes, 1983a; 1983b; 1998) and its subscales: (1) body-centered sexuality (4 scales); (2) power of sexual emotions (3 scales); and (3) love need in sex (2 scales). The SII was chosen because it is intended to measure attitudes toward abstinence from sexual activity. Low scores on all scales of the SII indicate support for

abstinence, therefore, it was hypothesized that total scores on the SAMS would correlate significantly and negatively with scores obtained on the SII (given that high scores on the SAMS indicate stronger motivation for abstinence).

Content validity was assessed through a panel of experts. Nine experts were contacted, and seven responded. Minimal formatting changes were made to the SAMS after input from the panel.

Reliability of the scores was assessed through two methods: computation of coefficient alphas for each factor, and testing split-half reliability. Although a test-retest reliability assessment would have been optimal to measure error (or stability of scores) over time (Selltiz, Wrightsman, & Look, 1976), split-half reliability was assessed instead in the interest of time for the participants.

Results

Given the similarity between the pilot and final stages of this study, only those findings from the final stage are presented here. In addition, this presentation focuses exclusively on results related to the *personal motivation* variable. Data for the variable “perceived motivation of today’s teenagers” exhibited less validity and reliability, serving, therefore, the purpose of highlighting the SAMS usefulness for measuring *personal motivation* (but not perceptions of others’ motivation). Because respondents’ scores were less reliable when measuring motivation for other people’s behaviors and much more consistent when measuring the respondents’ own motivation, it is reasonable

to assume that the SAMS is, indeed, a better measure of personal motivation than of perceptions of others' motivation.

Final Stage

A total of 1,410 individuals completed the final version of the SAMS. Fifty-nine percent of the final sample were from school 1 ($n=833$). The majority of the sample was Caucasian (67%) and female (67%). The primary religious affiliation of the participants was Protestant (60%), followed by Catholic (22%). The sample consisted primarily of 18 and 19-year-olds (43% and 41% respectively). When asked about their sexual activity status, sixty-eight percent of the participants classified themselves as virgins, while 19% labeled themselves sexually active. The remaining 13% considered themselves presently abstinent (had sex previously, but were now abstinent). Using descriptive statistics, the data revealed normal distribution, linearity, and no apparent outliers. No problems were detected regarding missing data for the SAMS items.

Within the pilot stage, an 11% attrition rate was observed in participant's answers to the SII, which was the second half of the questionnaire, compared to the participants' answers to the SAMS. Based on this, the only change made to the final version of the SAMS was to selectively use one scale of the SII in the final stage instead of the three used in the pilot stage. The Love Need in Sex scale was selected due to consistent Cronbach alpha scores from the pilot for the two subscales (scale 1, $\alpha = .848$, scale 2, $\alpha = .886$) and the original SII study alphas (scale 1, $\alpha = .80$, scale 2, $\alpha = .86$) (Lottes, 1983a; 1983b; 1998). The decision to keep all of the pilot stage SAMS items in

the final version was based on all pilot item factor loadings being above .469, the small sample size of the pilot stage, and the exploratory nature of this study.

Principal components analysis resulted in the extraction of eight factors for the personal motivation scale based on eigenvalues higher than 1.0 and the scree plot results. Accurate identification of factors using eigenvalues greater than 1.0 and a scree plot is ensured if based on the following conditions: $N > 250$ and a mean communality $\geq .60$ (Stevens, 1996). Personal motivation data met both criteria, with $N = 1,410$ and a mean communality of .64. Cumulatively, the eight factors accounted for 65% of the variance. All of the items had factor loadings of .445 and above, which far exceeds the critical factor loading value of .162 (for a sample of 1,000) established by Stevens as a way of taking sample size into account when interpreting factors (see Stevens, 1986). All items loaded successfully on at least one factor.

Using a more rigorous .5 criteria for factor loading, four items failed to load [*“...because I don’t want to feel guilty”* (item 15); *“...because I feel I am a role model for my siblings and/or other young people around me”* (item 23); *“...because I know what I want and will do what it takes to get it (I am strong willed)”* (item 28); and *“...because I want to stand out and/or be different”* (item 34)] and were flagged as candidates for deletion. After re-running the PCA without these four items, the amount of variance explained by the factors decreased by one percent (64%). Examination into the inter-item correlations of these items within factors, as suggested by Nunnally (1978), revealed one item with consistently low correlations (below .498): item 28. The deletion of this item from factor 1 resulted in a stable standardized alpha coefficient

(.94). Means and standard deviations of all four candidates for deletion did not indicate excessive variability (item 15 $X=3.33$, $SD=1.37$; item 23 $X=3.34$, $SD=1.47$; item 28 $X=3.57$, $SD=1.37$; item 34 $X=2.45$, $SD=1.42$). Two items, “...*because I don’t want to feel guilty*” (item 15) and “...*because my religion teaches me that sex outside marriage is wrong*” (item 40) loaded on more than one factor, one of which did not meet the .5 criteria for factor loading.

Examination of the correlation matrix revealed that the hypothesis of a significant, negative correlation between the SAMS and the SII was supported within personal motivation scores of the SAMS. More specifically, a significant negative correlation of $-.45$ ($p=.01$) was observed between personal motivation scores on the SAMS and scores on the SII.

Reliability of the scores was tested among each factor generated from the factor analysis using a Cronbach alpha and is presented in Table 2. Cronbach alphas within a split-half reliability analysis revealed high reliability among SAMS scores and SII scores. The personal motivation SAMS scores resulted in split-half Cronbach alphas of $.877$ (1st half) and $.911$ (2nd half), while SII had alphas of $.825$ and $.866$ (1st and 2nd halves, respectively).

Table 2

Exploratory Factor Analysis of SAMS (final sample – personal motivation), Using Principal Components Analysis, Varimax Rotation (only loadings larger than .40, reported)

	Factors							
	1	2	3	4	5	6	7	8
Factor 1: Commitment to Self-schema								
3. Commitment to future mate	.75	-	-	-	-	-	-	-
10. Commitment to higher being	.72	.52	-	-	-	-	-	-
11. Waiting for intimacy of marriage	.83	-	-	-	-	-	-	-
15. Not wanting to feel guilty	.45	.40	-	-	-	.41	-	-
18. Not wanting to lose respect for self	.61	-	-	-	-	-	-	-
20. Have higher self-esteem as result	.60	-	-	-	-	-	-	-
23. Role model for others	.50	-	-	-	-	-	-	-
24. Commitment with self	.77	-	-	-	-	-	-	-
25. Wanting to stay consistent with religion's views	.72	.56	-	-	-	-	-	-
27. Pledge/promise to abstain	.64	-	-	-	-	-	-	-
28. Strong willed	.45	-	-	-	-	-	-	-
32. Wanting to share history with future partner	.66	-	-	-	-	-	-	-
40. Religious teachings	.67	.61	-	-	-	-	-	-
41. Not wanting to lose respect of partner	.58	-	-	-	-	-	-	-
42. Not important to my life right now	.55	-	-	-	-	-	.48	-
44. Waiting for true love	.78	-	-	-	-	-	-	-

Table 2 Continued

	Factors							
	1	2	3	4	5	6	7	8
Factor 2: Risk of Disappointing Authority Figures								
6. Don't want to disappoint parents	-	.51	-	-	.43	-	-	-
14. Don't want to disappoint religious community	.47	.73	-	-	-	-	-	-
17. Don't want to confess to religious authority/community	-	.65	-	-	-	-	-	-
26. Responsibility to my parents	-	.61	-	-	.44	-	-	-
30. Want to please parents	-	.60	-	-	.44	-	-	-
35. Fear of not following family values (religious or cultural)	.44	.69	-	-	-	-	-	-
Factor 3: Fear/Apprehension of the Sexual Experience								
8. Fear of performance comparison	-	-	.69	-	-	-	-	-
19. Fear I don't know how to perform	-	-	.85	-	-	-	-	-
21. Embarrassed to show body	-	-	.68	-	-	-	-	-
33. Don't know what to expect	-	-	.66	-	-	-	-	-
Factor 4: Fear of Physical Consequences								
5. Fear of getting an STI	-	-	-	.80	-	-	-	-
7. Fear partner may have STI	-	-	-	.77	-	-	-	-
9. Fear of a pregnancy	-	-	-	.66	-	-	-	-
39. If I have an STI, not wanting to pass it on	-	-	-	.60	-	-	-	-
Factor 5: Value of Virginity								
4. Virginity is powerful	-	-	-	-	.65	-	-	-
12. Society values virgins	-	-	-	-	.60	-	-	-
34. Wanting to stand out/be different	-	-	-	-	.48	-	-	-

Table 2 Continued

	Factors							
	1	2	3	4	5	6	7	8
Factor 6: Reputation Regret								
31. Don't want bad reputation	-	-	-	-	-	.58	-	-
37. Worry what friends think	-	-	-	-	-	.58	-	-
38. Afraid of regret	-	-	-	-	-	.67	-	-
Factor 7: No Opportunity/Not Important								
13. No opportunity	-	-	.43	-	-	-	.51	-
16. Too busy	-	-	-	-	-	-	.72	
22. Don't want commitment of relationship	-	-	-	-	-	-	.53	-
43. Not important	-	-	-	-	-	-	.63	-
Factor 8: Manipulation								
29. Like being chased and keeping partner wanting more	-	-	-	-	-	-	-	.87
36. Like playing hard to get	-	-	-	-	-	-	-	.87
Eigenvalue	8.06	4.25	2.65	2.62	2.46	2.38	2.27	1.93
Percent of total variance explained by each factor	19.67	10.36	6.48	6.39	6.00	5.80	5.54	4.71
Cumulative variance explained	19.67	30.03	36.52	42.91	48.91	54.72	60.26	64.98
Cronbach alpha (α)	.94	.90	.78	.74	.67	.76	.61	.87

Discussion

This primary objective of this study was to construct and test a scale to measure the various dimensions of motivation for sexual abstinence among college students/young adults (SAMS). The methodology employed during this exploration intended to ensure that the Sexual Abstinence Motivation Scale can be used by the field of adolescent sexuality behavior research in the future as a tool that yields valid and reliable results.

The population of interest -- freshman students at two large universities in central Texas -- was strategically chosen to psychometrically test the SAMS. As entrance into the university environment provides ample opportunity for students to make personal decisions about behaviors (specifically sexual behavior) first year students have the capability to reflect retrospectively on experiences and are better able to reflect on the factors that comprise their motivation for sexual abstinence. Studying this particular population provided the opportunity to gain an individual and authentic perspective of sexual abstinence. Further confirmatory research could possibly impact future programming for both middle and high school students prior to entering the unsupervised arena of university life. Additional research will be needed with a younger population to examine if the SAMS remains relevant for younger teens.

Sample size is important for exploratory factor analysis, specifically the level of saturation within the factors from the measured variables (Guadagnoli & Velicer, 1988). Factors within a study are considered replicable if the sample size is at least 300 (Stevens, 1996). Similarly, Comrey and Lee (1992) suggest that while a sample size of 300 is good, a sample of 1,000 is considered excellent. The sample size of 1,410 within this

study adequately met this standard, providing an added level of certainty regarding the performance of the SAMS as a measurement tool.

Attention to detail with regard to quality is imperative during instrument development. According to recommendations from Smith et al. (2003), construction of the SAMS followed rigorous psychometric methods to reduce respondent error and instrument error -- both of particular importance with regards to research in abstinence. It is inferred that attention to detail in issues such as assuring anonymity and randomizing questions, produced a scale with less respondent error. Avoidance of excess instrument error was accomplished through a clear presentation of terms used in the scale and thorough psychometric testing. The methodology employed in the development of the SAMS was an attempt to contribute a quality measurement tool to the abstinence literature – a gap explained by Smith et al. (2003).

Based on the results from the exploratory factor analysis, the final version of the Sexual Abstinence Motivation Scale included eight scales and 41 items. The eight subscales (or factors) were: *Commitment to Self-schema* (F1), *Risk of Disappointing Authority Figures* (F2), *Fear/Apprehension of the Sexual Experience* (F3), *Fear of Physical Consequences* (F4), *Value of Virginity* (F5), *Reputation Regret* (F6), *No Opportunity/Not Important* (F7), and *Manipulation* (F8). All 42 original items tested indicated measurement of something, based on all items successfully loading on at least one factor, however, all items also must have yielded valid and reliable scores and were considered for deletion from the scale if they did not (Stevens, 1996, Tabachnick & Fidell, 2001; Thompson, 2003).

The results from factor analysis revealed some similarities with the factors elicited qualitatively in the previous concept mapping study (Dunsmore & Goodson, unpublished manuscript). For example, *Fear/Apprehension of the Sexual Experience*, *Fear of Physical Consequences*, and *Manipulation* were revealed as distinct factors in both studies. Other factors uncovered within this study such as *Commitment to Self-Schema* and *Risk of Disappointing Authority Figures* were combinations of independent factors such as *Religion*, *Future Orientation*, *Fear of Emotional/Moral Consequences*, and *Concerns Related to Social Responsibility* found in the earlier study. Examination into the similarities between the factors revealed in the previous concept mapping study, this exploratory analysis, and confirmatory factor analyses preformed in the future could provide further insight into the motivation for sexual abstinence.

Items 15, 28 and 40 were perhaps the best candidates for deletion from the final version of the SAMS based on both reliability and validity problems. Item 15 -- “...because I don’t want to feel guilty”-- loaded on three factors (none of which were at or above the .5 criteria for loading) and had marginal inter-item correlations (ranging from .357-.597). However, item 15 was supported by the qualitative data collected in the previous concept mapping study (Dunsmore & Goodson, unpublished manuscript) in which it was presented as one of the highest-rated motivators for sexual abstinence among the two groups of participants. If deleted, item 15 would also lower the standardized alpha slightly. In addition, the standard deviation of this item did not suggest problematic variability among scores. The decision was made to retain item 15 in hopes that further confirmatory examination may show item 15 as specifically

measuring guilt as it applies to one's self-schema, which is the factor that it loaded most heavily on.

Item 40 -- "*...because my religion teaches me that sex outside marriage is wrong*" -- also did not load successfully on a single factor, indicating that it was not clearly measuring a single attribute. However, both of this item's loadings were well above the rigorous .5 criteria. This item was rated fairly highly among the two groups of participants in the previous concept mapping study (Dunsmore & Goodson, unpublished manuscript). Perhaps rewording the original two qualitative statements ("*...Biblical doctrine: sin*"; and "*...religious views of marriage*") into a single item for the scale caused this item to measure aspects of both self-schema and influence of authority. Based on this fact, on moderately high inter-item correlations (ranging from .371 to .868, mean=.591) and only a slight decrease in standardized alpha coefficient if deleted from the scale (.940 to .933), this item was not deleted. It is recommended that item 40 be included in future examinations to specifically measure how motivating religious teachings regarding sex as wrong affect one's self-schema.

Item 28 -- "*...because I know what I want and will do what it takes to get it (I am strong willed)*" -- was also considered for deletion based on its low inter-item correlations and the stable standardized coefficient alpha for the factor if deleted. In addition, this item did not meet the .5 criteria for factor loading. The concept behind this item ("*...I am demonstrating that I am strong willed*") was generated by only one of the two groups in the previous concept mapping study (Dunsmore & Goodson, unpublished manuscript),

and was not rated as being significantly motivating. Based on this information, item 28 was the only item deleted from the final version of the SAMS.

Despite the exploratory nature of this study, our analyses of the psychometric properties of the SAMS lend support to the validity and reliability of the scores it generated. The examination of convergent validity of the SAMS showed significant correlations in the predicted direction with the SII, indicating that the instrument appears to be measuring motivation for sexual abstinence. This is a result of the thorough examination into the dimensions of motivation for sexual abstinence within the previous concept mapping study. By eliciting motivators for abstinent behavior from actual adolescents, we were able to capture this element appropriately in the construction of the scale.

Adequate reliability computed through Cronbach alpha in each factor of the SAMS demonstrated that within this particular sample, each factor yielded consistent scores among respondents. This self-consistency of scores is essential to instrument development goals such as comparing scores and predicting behavior (Ghiselli, 1981). The reliability demonstrated by the data in this study indicates that items within the SAMS are measuring the same construct -- motivation for sexual abstinence (Smith et al., 2003). Split-half reliability of the scores was clearly established in this study, further supporting the internal consistency of the SAMS (Thomas & Nelson, 1996).

Exploratory factor analysis is appropriate when expectations or theory regarding the structure of factors are missing (Saucier & Goldberg, 1996; Thompson, 2004). Prior to this study, assumptions about factors of motivation for sexual abstinence and their

possible structure were unknown (Dunsmore & Goodson, unpublished manuscript). As a result of this examination, preliminary elements now exist that can be tested for the development of these assumptions. Perhaps one of this study's greatest strengths is the contribution it makes to the development and refinement of a theory of motivation for sexual abstinence. Further examination, specifically confirmatory factor analysis using the SAMS, is necessary to continue this process.

Limitations

Despite its many strengths, this study's findings are limited by the sample design as well as the low response rate (14%). Despite efforts to make contact with all first year students at the two schools sampled via email, it is possible that some students did not check their email accounts, and therefore were not aware of the opportunity to participate.

The sample used in this study may be of some concern due to the rates of sexual activity uncovered, which are much lower than the national rates. According to a recent Youth Risk Behavior Survey, 61.6% of seniors in high school had had sexual intercourse at least once (Center for Disease Control, 2003). Among our sample, only 32% reported having had sex sometime in the past. Our sample was comprised largely of 18-19-year-old females, 30% of whom reported having sex at least once. This discrepancy between the rates in our sample and those nation-wide may be due to several possibilities. First, the students sampled in this study could legitimately be less sexually active than the national sample due to the characteristics of the geographic location and the schools in

which the study was conducted. The two participating universities are located in central Texas, one of which is a private faith-based institution. Religion seems to be of some significance to this group of participants, which was evident in ideas raised in the previous concept mapping study (Dunsmore & Goodson, unpublished manuscript) as well in the *Commitment to Self-schema* and *Risk of Disappointing Authority Figures* factors for sexual abstinence in both the pilot and final stages of this study. On the other hand, the uncharacteristic rates of sexual activity reported in this study could indicate that adolescents who are sexually abstinent were more likely to volunteer as respondents, thus potentially biasing the probability sample that was generated. We are unaware that any research design or recruiting elements could have potentially biased the sample, but further analysis of a different sample of adolescents will be required to address these issues.

A predominant limitation of any study using factor analysis to describe a particular construct lies in the nature of this analytical process. Despite revealing a factor structure of motivation that accounts for the associations among items within the SAMS, it cannot be assumed that the nature of motivation has been revealed *per se* (DeVellis, 2003). Due to the complex nature of factor analysis, misinterpretation is always a concern when using this strategy (Shiffman, 1993). Errors such as inferring that a stable factor structure confirms and validates the importance of observed patterns is a common misconception (Shiffman, 1993). Conclusions drawn from this investigation can only demonstrate that respondents agreed about how the items in the SAMS correlated, not necessarily that they agreed about the relevance or importance of the items.

Nevertheless, the qualitative results from the previous concept mapping study (Dunsmore & Goodson, unpublished manuscript) provide some measure of this assessment of importance or relevance. Further research is needed to further establish the external validity of this study's findings.

Another limitation often encountered in studies using factor analytic procedures is the subjective nature of factor extraction and item retention (Stevens, 1996). A choice between mathematical solutions, created through statistical means, and solutions with practical meaning is often required of the researcher, and can result in an overestimation or an underestimation of the number of actual factors extracted. Further investigation, specifically confirmatory factor analysis, is necessary to further verify these findings.

CHAPTER IV

CONCLUSION

The purpose of this study was to design and test a relevant and psychometrically sound scale to measure motivation for sexual abstinence. As proposed, the development of the Sexual Abstinence Motivation Scale (SAMS) was accomplished, and the rigorous exploratory psychometric tests performed resulted in a sound scale.

Based on the results from the exploratory factor analysis, the final version of the Sexual Abstinence Motivation Scale included eight scales and 41 items. The eight subscales (or factors) were: *Commitment to Self-schema* (F1), *Risk of Disappointing Authority Figures* (F2), *Fear/Apprehension of the Sexual Experience* (F3), *Fear of Physical Consequences* (F4), *Value of Virginity* (F5), *Reputation Regret* (F6), *No Opportunity/Not Important* (F7), and *Manipulation* (F8). These factors represented the grouping of indicators that reflected the phenomenon of interest: motivation for sexual abstinence.

The development and testing of a scale to measure motivation for sexual abstinence within this study represents groundbreaking work. The items developed within the SAMS were written for constructs which had not been measured before, but which are essential to the adolescent sexuality literature. In addition, the results of strong internal consistency and validity of the data developed by such a large sample provided adequate psychometric backing to this investigation.

As a result of the exploratory nature of this study, the SAMS scores were used in a cumulative nature for analysis purposes. Scores were summed for the entire scale, as opposed to summing each of the eight sub-scales. Therefore, a higher score on the entire scale is an indication of higher motivation for sexual abstinence. The SAMS needs to be subjected to confirmatory factor analysis to verify the existence of the eight factors uncovered in this study before each of the sub-scales (factors) can be used individually (Tabachnick & Fidell, 2001; Thompson, 2004).

It is important to note the directions for future research that have emerged from this study. Due to the lack of published research surrounding motivation for sexual abstinence, a grounded theory was not known a priori. Although the results of the qualitative concept mapping process provided preliminary expectations as to the dimensions of motivation for abstinence, the decision to use exploratory analyses was made in order to strengthen the psychometric qualities of the SAMS. As a result, confirmatory factor analysis is needed to verify these results. Research involving a different, but equally large sample is suggested to confirm the factor pattern of the SAMS.

Perhaps one of the greatest strengths of this study is – alongside providing a sound measurement tool - its proposal of a firm foundation for the future development and testing of a theory regarding motivation for sexual abstinence among adolescents. By way of systematic exploratory and confirmatory analyses, an inductive approach is possible for empirically deriving a theory regarding the nature of this complex construct (Thompson, 2004).

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APPENDIX A
MEASUREMENT THEORY

Measurement theory is essential to the process of building an instrument to examine the construct of motivation. Ghiselli (1964) suggests that measurement is simply the method that researchers use to quantitatively describe the extent of an individual's manifestation or possession of certain characteristics. The classical measurement model assumes that individual items measuring these characteristics are comparable indicators of the underlying construct, in this case, motivation (DeVellis, 2003). As a result, defining characteristics of the construct of interest and then developing operations to measure those characteristics are imperative.

The characteristic of being "motivated" is not directly observable and is not constant; therefore, motivation is considered a latent variable (DeVellis, 2003). Measures of the latent variable become proxies for the actual construct, with each item giving an indication of the strength of the latent variable. An exploration into the relationships between the measures infers the relationship between the factors (Ghiselli et al., 1981). The value of these measures, or factors, is caused by an underlying construct -- in this case motivation -- and is often examined through a scale (DeVellis, 2003; Stevens, 1996).

Many multi-item measures exist, but scales are often used in the assessment of constructs that are not easily observable such as motivation (DeVellis, 2003). Scales differ from other types of measurement, in that they contain "effect indicators" or items whose value is determined by an overarching construct (Bollen, 1989; Loehlin, 1998; DeVellis, 2003). The alternative would be a measure containing "cause indicators," which would dictate the level of a construct, known as an index (DeVellis, 2003). For example, dimensions such as fear, religiosity, and parental influence may all indicate

motivation for sexual abstinence and their measurement would fit the characteristics of a scale due to the inability to capture their complexity with one item. On the other hand, an index would be more appropriate when measuring the level of an adolescent's sexual behavior, which could be based on one item: the number of times that individual has had sexual intercourse.

Classical reliability theory states that creation of a measurement instrument requires attention to both reliability and validity concerns to ensure each person has a true score for any test (Nunnally, 1978) and that individuals can be compared based on results from any assessment. Smith et al. (2003) suggest that a focus on these basic rules of survey construction and attention to psychometric properties are essential for effective instruments, specifically those measuring abstinence. By testing the psychometric properties of an instrument, insight is possible into whether validity and reliability problems exist (Smith et al., 2003).

Psychometrics, originating from the fields of psychology and education, has historically been utilized in the construction of multi-item health measurement tools (Wright & Feinstein, 1992). This methodology includes the development of homogenous scales that measure a single characteristic or attribute, and the exploration of relationships among factors through mathematical procedures (Marx et al., 1999). The development of an instrument to measure a psychological construct with multiple dimensions such as motivation hinges on this deductive process in order to uncover the pattern of correlations among factors/dimensions (Stevens, 1986).

According to Duncan (1984), psychometrics had evolved into a methodological paradigm all its own based on three phenomena: 1) the prevalent use of psychometric definitions of validity and reliability, 2) the widespread use of factor analysis in research, and 3) the broadening variables for which psychometric methods are being used for scale development.

APPENDIX B
DATA COLLECTION STEPS

Data were gathered in two stages: the pilot stage and the final stage. Anonymity was assured orally upon visiting the classes, on the invitation email, as well as on the information page at the beginning of the survey. All stages of this study were approved by the Institutional Review Boards of both participating schools.

PILOT STAGE	FINAL STAGE
<ul style="list-style-type: none"> Primary author visited 4 undergraduate classes at each school to announce opportunity and incentive drawing of free digital camera 	<ul style="list-style-type: none"> Primary author secured comprehensive email listings of all first year students from computer information systems at each school (N=10,330)
<ul style="list-style-type: none"> Interested participants provided an email address where they could be contacted (N=98) 	<ul style="list-style-type: none"> Invitation email was sent with link to the website containing the SAMS with a 10-day window of time for completion
<ul style="list-style-type: none"> Invitation email was sent with link to the website containing the SAMS with a 10 day window of time for completion 	<ul style="list-style-type: none"> Reminder email sent after 7 days (Dillman, 2000)
<ul style="list-style-type: none"> Reminder email was sent after 7 days (Dillman, 2000) 	

Dillman, D.A. (2000). **Mail and Internet Surveys**. 2nd edition. New York: John Wiley & Sons, Inc.

APPENDIX C

RESULTS FROM PILOT STAGE AND

PERCEIVED MOTIVATION VARIABLE

Pilot Stage – *personal motivation and perceived motivation of today's teenagers*

The 72 participants in the pilot test were almost equally divided into the two participating groups (56% = group 2, n=40). Over half of the sample was female (52%, n=36) with an average age of 20 years. The majority of the participants were white (71%, n=49), 12% were Hispanic (n=8) and 10% Asian/Pacific Islanders (n=7). Protestants (51%, n=35) and Catholics (29%, n=20) made up the majority of the sample. Forty-seven percent of the sample classified their present sexual activity status as sexually active, while thirty-five percent reported being virgins. Eighteen percent categorized themselves as presently abstinent (had sex in the past and have recommitted to remaining abstinent until a specified time in the future).

An examination of the descriptive statistics for the pilot data indicated that all of the SAMS items (N=42) were normally distributed. Principal components factor analyses with Varimax rotation were performed on all SAMS items (categorizing answers into two groups based on the two variable sets: personal motivation and peer motivation). Factor extraction was based on two empirical criteria: eigenvalues and scree tests. Eigenvalues over 1.0 are evidence of a factor and provide a measure of the amount of information in a given factor (Guttman, 1954; Kaiser, 1960). A scree test, or the plotted graph of the eigenvalue, provides a visual image of approximately where the information contained in each factor begins to wane (Thompson, 2004). Data analysis revealed ten factors with eigenvalues greater than 1.0 for both *personal motivation* and *perceived motivation of today's teenagers*. Cumulatively, the ten factors accounted for 74% of the variance in personal motivation, and 73% of the variance in peer motivation.

Among the *personal motivation* scores, the first four factors emerging with the largest eigenvalues had clear item patterns: *Religion/Parental Influence* (F1), *Self-Schema* (F2), *Fear/Apprehension of the Physical Experience* (F3), *Value of Virginity* (F4), and *Manipulation* (F5). The remaining five factors were problematic for several reasons. The scree plot results revealed the point of leveling off at factor 6, indicating that only the first five factors should be extracted. Although all 44 items loaded significantly on a factor using .3 as a cut-off due to the small sample size (Stevens, 1986), utilization of a more rigorous .5 criteria resulted in factors 6-10 retaining only one item per factor, except for factor seven which had two items load above .5. Using the .5 criteria resulted in five items failing to load on any factors (items 31, 32, 34, 38 and 39).

Among the *perceived motivation of today's teenagers* scores, four of the first five factors revealed clear patterns of ideas among items: *Commitment to Religion and Parental Influence* (F1), *Self-Schema* (F2), *Fear/Apprehension of the Physical Experience and Reputation* (F4), and *Expectations* (F5). Factor 3 did not reveal a clear pattern of ideas due to the fact that it only had one item load above .5. Factors 6 through 10 did not exhibit any clear item patterns, and were not recommended for extraction based on the scree plot results. Factors six and seven only had two items load above .5, while factors nine and ten had only one item load. Factor eight did have three items load above the critical value of .5, although the pattern of ideas was not clear. All items loaded on at least one factor using .3 as a criteria (Stevens, 1986), but eight items failed to load using .5 as a cutoff (items 4, 5, 9, 12, 31, 34, 37, and 44).

Reliability was tested on the pilot data through computation of Cronbach alphas on each of the extracted factors resulting from the factor analysis. *Personal motivation* factors resulted in standardized coefficient alphas of .958 (F1), .833 (F2), .773 (F3), .681 (F4), and .80 (F5). Peer motivation Cronbach alphas were .931 (F1), .880 (F2), .725 (F4), and .785 (F5). Split-half reliability was not performed on the pilot data due to the small sample size.

Convergent validity was demonstrated by correlating the scores on the SAMS with the scores on the Sexual Ideology Instrument (SII) (Lottes, 1983a; 1983b; 1998). As hypothesized, a negative correlation was observed between scores on the SAMS and the SII, although only *personal motivation* SAMS scores had a significant negative correlation ($r = -.53$). An 11% attrition rate was observed in participant's answers to the SII, which was the second half of the questionnaire, compared to the participants' answers to the SAMS.

The only change made to the questionnaire submitted to respondents in the final stage was to selectively use one scale of the SII instead of the three used in the pilot due to attrition rates. The Love Need in Sex scale was selected due to consistent Cronbach alpha scores from the pilot for the two subscales (scale 1 $\alpha = .848$, scale 2 $\alpha = .886$) and the original study alphas (scale 1 $\alpha = .80$, scale 2 $\alpha = .86$). The decision to keep all of the original items from the SAMS in the final version was based on all five of these factor loadings being above .469, the small sample size, the exploratory nature of this analysis.

Final stage – *perceived motivation of today's teenagers*

PCA revealed seven factors as candidates for extraction within the *perceived motivation of today's teenagers* scale data, based on both eigenvalues of 1.0 or higher and the scree plot results. Although the mean communality of the items was .56, which is just below the suggested cutoff of .60 (Stevens, 1996), we believe the large sample size warrants inclusion of seven factors. Fifty-six percent of the variance was explained by these factors. All items had factor loadings of .393 or higher, which also exceeds the critical value of .162 as stated by Stevens (1986) with samples of 1,000 or greater.

Subjecting *perceived motivation of today's teenagers* scores to the more rigorous .5 criteria for factor loading, 12 items failed to load (items 3, 8, 16, 17, 20, 22, 23, 31, 32, 33, 34, 37, 38, and 39). Four items loaded on more than one factor: “I am/was sexually abstinent because I am too busy to think about sex” (item 16), “I am/was sexually abstinent because I don’t want to have a bad reputation” (item 31), “I am/was sexually abstinent because I want to stand out and/or be different” (item 34) and “I am/was sexually abstinent because true love is worth waiting for” (item 44).

APPENDIX D
ADDITIONAL QUESTIONNAIRE CLUSTERS

The purpose in developing the concept maps in an earlier study (Dunsmore & Goodson, unpublished manuscript) was to uncover the various dimensions of motivation for sexual abstinence through statements generated by the participants. Nine specific clusters (dimensions) of motivation for sexual abstinence were identified between the two groups: *Religion, Fear of Physical/Sexual Relationship, Future Orientation, Positive Outcomes/Positive Aspect of Abstinence, Concerns Related to Social Responsibility, Fear of Emotional/Moral Consequences, and Fear of Physical Consequences* (Dunsmore & Goodson, unpublished manuscript). It is important to note that two of the nine clusters were not specifically generated by the statistical analysis in the study, but added by the authors.

The cluster entitled “Control/Manipulation” was created after it was identified as a sub-cluster within one of the main clusters. The authors thought it was important to follow this dimension in the instrument, but felt it would possibly get lost if embedded within another cluster.

Another pattern observed in the concept mapping data the authors thought might be important to examine was the *lack* of motivation (based on Self-Determination Theory) also referred to as *amotivation* (Deci & Ryan, 1985). A final cluster was added by the authors to assess this possible dimension, based on statements from the original statement set (Dunsmore & Goodson, unpublished manuscript) that were representative of amotivation. These nine clusters provided the wording for the items to be used in the SAMS (see Table 1).

How motivating each statement was for sexual abstinence was measured with a five point Likert-type scale in the previous concept mapping study (Dunsmore & Goodson, unpublished manuscript), and average ratings were calculated. Based on these data, statements within each cluster were then evaluated and eliminated if they had an average rating below 3.0 -- indicating that the statement was considered by the group to be only fairly motivating or not motivating at all. Statements were only maintained for inclusion in the SAMS if they were rated as *moderately motivating*, *very motivating*, or *extremely motivating* (see Table 1) (Dunsmore & Goodson, unpublished manuscript).

APPENDIX E
PILOT INFORMATION SHEET

Information Sheet¹
Why abstain from sex? Building and testing the
Sexual Abstinence Motivation Scale (SAMS).
(Pilot)

You have been asked to participate in a research study about motivation for sexual abstinence. You were selected to be a possible participant because you are a XXXX University undergraduate student enrolled in a basic required class in summer session I. A total of 100 people have been asked to participate in this study. The purpose of this study is to construct an instrument that measures motivation to abstain from sexual activity in young adults as part of a doctoral dissertation.

If you agree to be in this study, you will be asked to participate in a survey that will require you to rate statements about motivation for sexual abstinence. You will be asked to rate various reasons for abstinence according to how motivating the statement is for you as well as what you think for today's teens. This activity will be online (delivered to you via email) and will take approximately 15 minutes. There are no apparent risks to participating in this study. The benefit of participation includes the possibility of winning a digital camera.

This study is confidential. Once all survey responses are received and the drawing for the camera has been completed, all identifiers will be destroyed. Any information you give in the survey will not be associated in any way with your identity. The records of this study will be kept private. No identifiers linking you to the study will be included in any sort of report that might be published. Research records will be stored securely and only the primary researcher will have access to the records. Your decision whether or not to participate will not affect your current or future relations with XXXX University or the classes in which you are enrolled. If you decide to participate, you are free to refuse to answer any of the questions that may make you uncomfortable. You can withdraw at any time with out relations with the university, class or primary investigator being affected. You can contact the primary investigator, Sarah Dunsmore at 254-857-9670, 476 Mitchell Rd. Lorena, TX 76655, sarah_dunsmore@baylor.edu with any questions about this study. You can also contact the advisor to the primary investigator, Dr. Patricia Goodson at 979-845-1756 or pgoodson@hlkn.tamu.edu.

This research study has been reviewed by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subject's rights, you can contact the Institutional Review Board through Ms. Angelia Raines, Director of Research Compliance, Office of Vice President for Research at 979-458-4067 or araines@vprmail.tamu.edu.

By clicking the "Go to Survey" link below, you are stating you are at least 18 years of age, and you voluntarily agree to participate in this survey. Once you click on the link, you will automatically be taken to the SAMS. You may print this page for your records

¹ Used in place of an informed consent form, given that the survey was electronic, or web-based.

APPENDIX F
FINAL INFORMATION SHEET

Information Sheet²
**Why abstain from sex? Building and testing the
Sexual Abstinence Motivation Scale (SAMS).**

You have been asked to participate in a research study about motivation for sexual abstinence. You were selected to be a possible participant because you are a XXXX University undergraduate student enrolled in a basic required class in summer session I. A total of 10,330 people have been asked to participate in this study. The purpose of this study is to construct an instrument that measures motivation to abstain from sexual activity in young adults as part of a doctoral dissertation.

If you agree to be in this study, you will be asked to participate in a survey that will require you to rate statements about motivation for sexual abstinence. You will be asked to rate various reasons for abstinence according to how motivating the statement is for you as well as what you think for today's teens. This activity will be online (delivered to you via email) and will take approximately 15 minutes. There are no apparent risks to participating in this study. The benefit of participation includes the possibility of winning a digital camera.

This study is confidential. Once all survey responses are received and the drawing for the camera has been completed, all identifiers will be destroyed. Any information you give in the survey will not be associated in any way with your identity. The records of this study will be kept private. No identifiers linking you to the study will be included in any sort of report that might be published. Research records will be stored securely and only the primary researcher will have access to the records. Your decision whether or not to participate will not affect your current or future relations with XXXX University or the classes in which you are enrolled. If you decide to participate, you are free to refuse to answer any of the questions that may make you uncomfortable. You can withdraw at any time with out relations with the university, class or primary investigator being affected. You can contact the primary investigator, Sarah Dunsmore at 254-857-9670, 476 Mitchell Rd. Lorena, TX 76655, sarah_dunsmore@baylor.edu with any questions about this study. You can also contact the advisor to the primary investigator, Dr. Patricia Goodson at 979-845-1756 or pgoodson@hlkn.tamu.edu.

This research study has been reviewed by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subject's rights, you can contact the Institutional Review Board through Ms. Angelia Raines, Director of Research Compliance, Office of Vice President for Research at 979-458-4067 or araines@vprmail.tamu.edu.

By clicking the "Go to Survey" link below, you are stating you are at least 18 years of age, have not taken any version of the SAMS before (ie. the pilot study), and you voluntarily agree to participate in this survey. Once you click on the link, you will automatically be taken to the SAMS. You may print this page for your records.

² Used in place of an informed consent form, given that the survey was electronic, or web-based.

APPENDIX G

EMAIL INVITATION FOR PILOT AND FINAL STAGES

Subject line: Freshman survey & digital camera drawing

Dear Aggie freshman,

Do you want to win a **FREE** digital camera? If so, we would like your opinion in our survey -- the Sexual Abstinence Motivation Scale.

Simply go to the link below and fill out the online health survey (which should take no more than 15 minutes) and your name will be entered in a drawing to win the camera by September 30, 2005. You will be contacted via email if you are the winner.

Please note: the survey is only available for **10 days** (July 22-August 1, 2005). Only people who go to the survey during the allotted time will be eligible for the drawing.

<http://www.zoomerang.com/survey.zgi?p=WEB224HHUFA27N>

Thank you!

Sarah Dunsmore

Graduate Student

Texas A&M University

Subject line: REMINDER: freshman survey & digital camera drawing

Dear Baylor freshman,

Last week an email was sent to you describing an online survey – the Sexual Abstinence Motivation Scale. By participating your name will be entered into a drawing for a **FREE** digital camera by September 30, 2005. This survey is intended for students who have just *finished* their freshman year.

If you have already visited the website below and completed the survey, please accept my sincere thanks. If you have not, please take **15 minutes** to visit the survey on the website. Your input is extremely important for this research.

Please note: the survey is only available for **10 days** (July 22-August 1, 2005). You only have **4 days left!** Only people who go to the survey during the allotted time will be eligible for the drawing.

<http://www.zoomerang.com/survey.zgi?p=WEB224HHRT9YLD>

Thank you!

Sarah Dunsmore

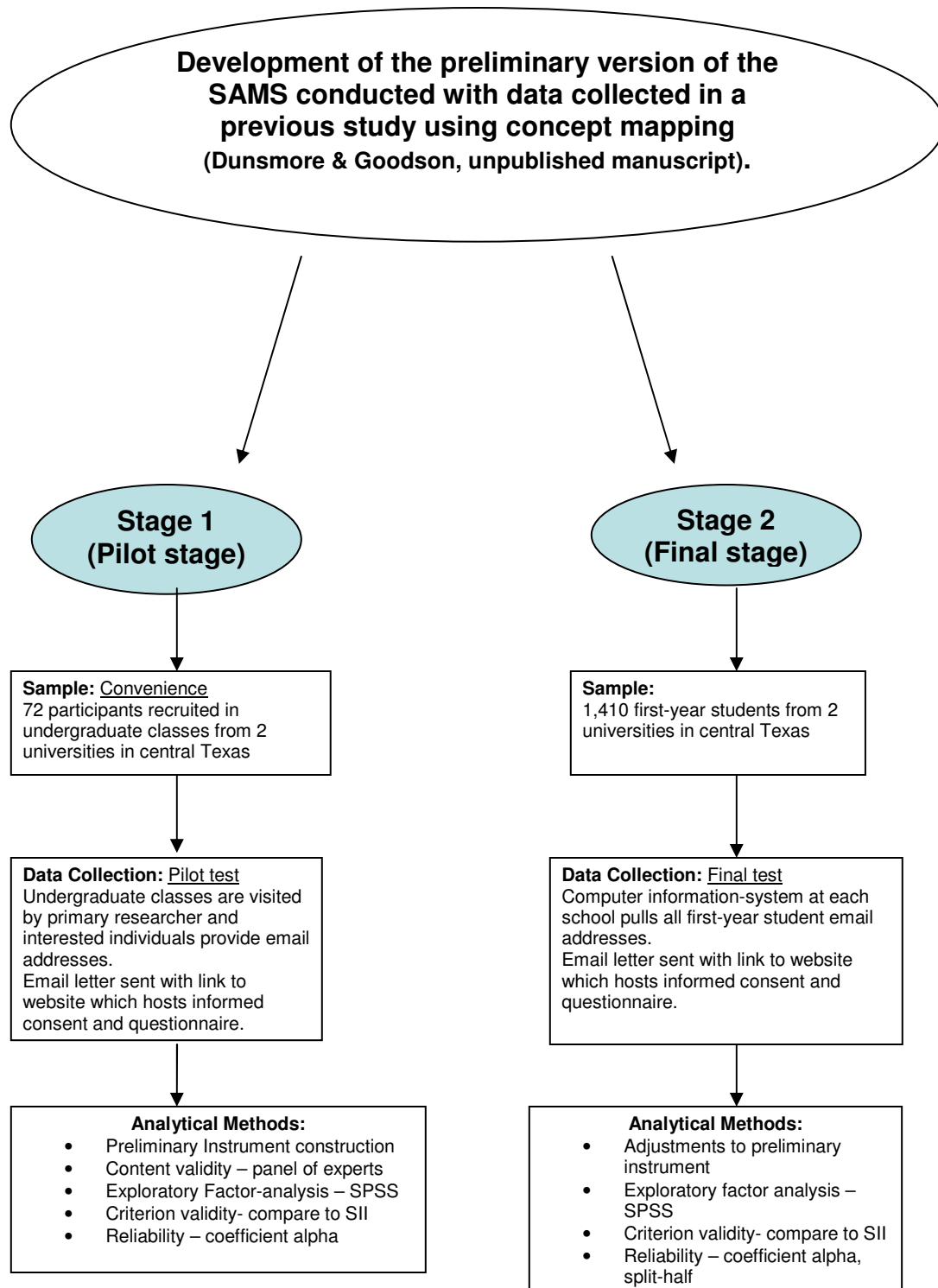
Faculty Member

Baylor University

APPENDIX H

STAGES IN THE DEVELOPMENT AND

TESTING OF THE SEXUAL ABSTINENCE MOTIVATION SCALE (SAMS)



APPENDIX I
SAMS PILOT VERSION

Sexual Abstinence Motivation Scale (SAMS) (Pilot)

Researchers are interested in what motivates adolescents/young adults to be sexually abstinent. By **sexually abstinent** we mean: *to avoid and restrain from sexual intercourse or other sexual acts that may lead to sexual intercourse*. Whether you are sexually active or not right now, we want to know what motivates you (now) or what motivated you (in the past) to be **sexually abstinent**. We are also interested in what you believe motivates today's adolescents to be **sexually abstinent**.

Below is a list of motivations for sexual abstinence. This list was generated by college students just like you. For each of the reasons listed below, *first* tell us how motivating each reason is or might have been for you in the past on a scale of 1-5 (1 = not motivating at all; 5 = extremely motivating). *Then* rate how motivating you believe the reason might be for today's teens. For example:

I am/was sexually abstinent:

...because I do not want to rush the relationship with my partner.

How Motivating:

For me (1-5)

For today's teens (1-5)

***note: if you are now sexually active, read all statements in past tense (for example:**

...because I didn't want to rush the relationship with my partner.)

Useful definitions of key words:

Sexual activity: participation in oral, anal, or vaginal intercourse

STI (sexually transmitted infection): also known as sexually-transmitted diseases (STDs) - diseases that are commonly transmitted between partners through some form of sexual activity, most commonly vaginal intercourse, oral sex, or anal sex (ie. HIV, chlamydia, syphilis)

Partner: the person with whom you (within the situation being presented in the statement) would/will be sexually active.

I am/was sexually abstinent:

- ...because I am committed to my future partner.
- ...because being a virgin makes me powerful.
- ...because I am afraid of getting an STI.
- ...because I don't want to disappoint my parents.
- ...because I am afraid my partner may have an STI.
- ...because I am afraid of being compared to somebody else regarding sexual performance.
- ...because I am afraid of a pregnancy.
- ...because I am committed to a higher being (for example: God or Allah).
- ...because I am waiting for the true intimacy that comes with marriage.
- ...because I believe society values virgins more than non-virgins.
- ...because I don't date anyone, and don't have the opportunity.
- ...because I don't want to disappoint my religious community (for example: church family).
- ...because I don't want to feel guilty.
- ...because I am too busy to think about sex.
- ...because I don't want to have to confess/admit to a religious authority and/or community.
- ...because I don't want to lose respect for myself.
- ...because I fear that I don't know how to perform.
- ...because I feel better about myself (have a higher

self-esteem) knowing I am abstaining.
 ...because I feel embarrassed to show my body.
 ...because I don't want to commit myself to a relationship.
 ...because I feel I am a role model for my siblings and/or other young people around me.
 ...because I have a commitment with myself to abstain.
 ...because I want to stay consistent with my religion's view of sex and marriage.
 ...because I have a responsibility to my parents to remain abstinent.
 ...because I have pledged/promised to remain abstinent.
 ...because I know what I want and I will do what it takes to get it (I am strong willed).
 ...because I like being chased and keeping the other person wanting more.
 ...because I want to please my parents by staying abstinent.
 ...because I don't want to have a bad reputation.
 ...because I want to share a similar sexual history with my future partner.
 ...because I don't know what to expect.
 ...because I want to stand out and/or be different.
 ...because I worry about going against my family's religious or cultural values.
 ...because I like to play hard to get.
 ...because I worry what my friends would think if I had sex.
 ...because I'm afraid of regretting having sex.
 ...because if I have an STI, I don't want to pass it on to my partner.
 ...because my religion teaches that sex outside of marriage is wrong.
 ...because I don't want to lose the respect of my partner.
 ...because other things in my life are more important than sex.
 ...because sex is not important to me right now.
 ...because true love is worth waiting for.

Please choose answers that apply to you:

Gender: Male Female

Age: 18 19 20 21 22 23 24 25 26

Ethnic Origin:

American Indian/Alaskan Native
 Asian/Pacific Islander
 Black/African American
 Hispanic
 White/Caucasian
 Other

Program of Study (program of which your major is housed):

Program listings varied depending on school

Classification: Freshman Sophomore Junior Senior

Religious Affiliation: no religious preference Protestant (ie. Baptist, Methodist, etc.)

Buddhist
 Muslim (Moslem) Catholic Hindu Jewish
 Other

What is your present sexual activity status: (Choose only one)

Virgin (I have never engaged in sexual intercourse before)

Sexually Active (I had sex in the past, and am not committed to abstinence)
Presently Abstinent (I had sex in the past and have recommitted to remaining abstinent until a specified time in the future).

*** Answer this next question only if you categorized yourself as “Presently Abstinent” above:**

Below is the list of motivations for sexual abstinence that you rated a few minutes ago. Which reason BEST explains why you decided to become sexually abstinent (please select only one):

- ...because I am committed to my future partner.
- ...because being a virgin makes me powerful.
- ...because I am afraid of getting an STI.
- ...because I don't want to disappoint my parents.
- ...because I am afraid my partner may have an STI.
- ...because I am afraid of being compared to somebody else regarding sexual performance.
- ...because I am afraid of a pregnancy.
- ...because I am committed to a higher being (for example: God or Allah).
- ...because I am waiting for the true intimacy that comes with marriage.
- ...because I believe society values virgins more than non-virgins.
- ...because I don't date anyone, and don't have the opportunity.
- ...because I don't want to disappoint my religious community (for example: church family).
- ...because I don't want to feel guilty.
- ...because I am too busy to think about sex.
- ...because I don't want to have to confess/admit to a religious authority and/or community.
- ...because I don't want to lose respect for myself.
- ...because I fear that I don't know how to perform.
- ...because I feel better about myself (have a higher self-esteem) knowing I am abstaining.
- ...because I feel embarrassed to show my body.
- ...because I don't want to commit myself to a relationship.
- ...because I feel I am a role model for my siblings and/or other young people around me.
- ...because I have a commitment with myself to abstain.
- ...because I want to stay consistent with my religion's view of sex and marriage.
- ...because I have a responsibility to my parents to remain abstinent.
- ...because I have pledged/promised to remain abstinent.
- ...because I know what I want and I will do what it takes to get it (I am strong willed).
- ...because I like being chased and keeping the other person wanting more.
- ...because I want to please my parents by staying abstinent.
- ...because I don't want to have a bad reputation.
- ...because I want to share a similar sexual history with my future partner.
- ...because I don't know what to expect.
- ...because I want to stand out and/or be different.
- ...because I worry about going against my family's religious or cultural values.
- ...because I like to play hard to get.
- ...because I worry what my friends would think if I had sex.

- ...because I'm afraid of regretting having sex.
- ...because if I have an STI, I don't want to pass it on to my partner.
- ...because my religion teaches that sex outside of marriage is wrong.
- ...because I don't want to lose the respect of my partner.
- ...because other things in my life are more important than sex.
- ...because sex is not important to me right now.
- ...because true love is worth waiting for.

This final portion of the survey is taken from the Sexual Ideology Instrument (Lottes, 1998). Please take a few minutes to finish this portion:

For each of the statements below, indicate whether you strongly agree=1; agree=2; are undecided=3; disagree=4; or strongly disagree=5.

Respond the way you really feel, which may or may not be in agreement with the majority of public opinion.

- a. Women who emphasize sexual pleasure in their lives overlook life's more important pursuits.
- b. Sexual emotions are strong but manageable by most males.
- c. Having a physical attraction to someone would be sufficient for me to enjoy sex with that person.
- d. It is acceptable for a 16- to 17-year-old unmarried male to have sexual intercourse.
- e. Masturbation is an acceptable activity for males
- f. I would feel very guilty if I had sexual relations with someone I did NOT love.
- g. I would be very upset if my spouse had had many previous sexual relationships.
- h. Since many men seem to be unable to control their sex drive, it is important for women to be in control of theirs.
- i. I do NOT respect women who appear in pornographic films or magazines.
- j. I approve of a man having premarital sex with someone he likes but is NOT in love with.
- k. Women degrade themselves when they show obvious sexual interest in a man they are NOT in love with.
- l. Men can have affairs that do NOT disrupt their lifestyle.
- m. A successful and satisfying sex partnership CANNOT be established unless the sex partners are quite willing to be sexually faithful to one another.
- n. It would be difficult for me to enjoy sex with someone I did NOT love.
- o. Women can have affairs without significant emotional involvement.
- p. I approve of a woman having extra-marital sex WITH her husband's consent.
- q. If a women yield to their sexual feelings, these feelings will probably disrupt and dominate their lives in destructive ways.
- r. I approve of a man having premarital sex with someone he is strongly attracted to but knows only casually.
- s. Group sex (sex involving more than two people) is an acceptable sexual activity for men and women.
- t. John is married to Ann. John is strongly attracted to, but not in love with Mary. I approve of John and Mar having sexual relations.
- u. Extra marital sex is always wrong.

- v. Sexuality is a very powerful force and females should do all they can to control it in their lives.
- w. It is acceptable for a 16- to 17-year-old unmarried female to have sexual intercourse.
- x. I approve of a man having extra-marital sex WITHOUT his wife's consent.
- y. I would NOT object to my spouse having had a couple of previous sexual relationships.
- z. I can accept and do NOT condemn homosexual activities for females.
- aa. Sexual emotions are strong but manageable by most females.
- bb. I approve of a woman having premarital sex with someone she likes but is NOT in love with.
- cc. A man CANNOT have a satisfactory and satisfying sex life without being in love with his sex partner.
- dd. Sexual intercourse with someone other than the regular sex partner can bring about an improvement in the sexual relationship of the established pair.
- ee. I approve of a man having extra-marital sex WITH his wife's consent.
- ff. Masturbation is an acceptable activity for females.
- gg. I approve of a woman having premarital sex with someone she is strongly attracted to but knows only casually.
- hh. Men can have affairs without significant emotional involvement.
- ii. If men yield to their sexual feelings, these feelings will probably disrupt and dominate their lives in destructive ways.
- jj. A woman CANNOT have a satisfactory and satisfying sex life without being in love with her sex partner.
- kk. Ann is married to John. Ann is strongly attracted to, but not in love with Jim. I approve of Ann and Jim having sexual relations.
- ll. Sexuality is a very powerful force and males should do all they can to control it in their lives.
- mm. Basically, I simply love sex and would enjoy making love to many different people.
- nn. Men who emphasize sexual pleasure in their lives overlook life's more important pursuits.
- oo. I can accept and do NOT condemn homosexual activity for males.
- pp. Sexual intercourse is often best when enjoyed for its own sake, rather than for the purpose of expressing love.
- qq. I approve of a woman having extramarital sex WITHOUT her husband's consent.
- rr. Casual sexual intercourse with a variety of sex partners can be as satisfying and satisfactory as intercourse that is limited to an established sex partnership.
- ss. Women can have affairs that do NOT disrupt their lifestyle.

APPENDIX J
SAMS FINAL VERSION

Sexual Abstinence Motivation Scale (SAMS)

Researchers are interested in what motivates adolescents/young adults to be sexually abstinent. By **sexually abstinent** we mean: *to avoid and restrain from sexual intercourse or other sexual acts that may lead to sexual intercourse*. Whether you are sexually active or not right now, we want to know what motivates you (now) or what motivated you (in the past) to be **sexually abstinent**. We are also interested in what you believe motivates today's adolescents to be **sexually abstinent**.

Below is a list of motivations for sexual abstinence. This list was generated by college students just like you. For each of the reasons listed below, *first* tell us how motivating each reason is or might have been for you in the past on a scale of 1-5 (1 = not motivating at all; 5 = extremely motivating). *Then* rate how motivating you believe the reason might be for today's teens. For example:

I am/was sexually abstinent:

...because I do not want to rush the relationship with my partner.

How Motivating:

For me (1-5)

For today's teens (1-5)

***note: if you are now sexually active, read all statements in past tense (for example:**

...because I didn't want to rush the relationship with my partner.)

Useful definitions of key words:

Sexual activity: participation in oral, anal, or vaginal intercourse

STI (sexually transmitted infection): also known as sexually-transmitted diseases (STDs) - diseases that are commonly transmitted between partners through some form of sexual activity, most commonly vaginal intercourse, oral sex, or anal sex (ie. HIV, chlamydia, syphilis)

Partner: the person with whom you (within the situation being presented in the statement) would/will be sexually active.

I am/was sexually abstinent:

- ...because I am committed to my future partner.
- ...because being a virgin makes me powerful.
- ...because I am afraid of getting an STI.
- ...because I don't want to disappoint my parents.
- ...because I am afraid my partner may have an STI.
- ...because I am afraid of being compared to somebody else regarding sexual performance.
- ...because I am afraid of a pregnancy.
- ...because I am committed to a higher being (for example: God or Allah).
- ...because I am waiting for the true intimacy that comes with marriage.
- ...because I believe society values virgins more than non-virgins.
- ...because I don't date anyone, and don't have the opportunity.
- ...because I don't want to disappoint my religious community (for example: church family).
- ...because I don't want to feel guilty.
- ...because I am too busy to think about sex.
- ...because I don't want to have to confess/admit to a religious authority and/or community.
- ...because I don't want to lose respect for myself.
- ...because I fear that I don't know how to perform.
- ...because I feel better about myself (have a higher self-esteem) knowing I am abstaining.

...because I feel embarrassed to show my body.
 ...because I don't want to commit myself to a relationship.
 ...because I feel I am a role model for my siblings and/or other young people around me.
 ...because I have a commitment with myself to abstain.
 ...because I want to stay consistent with my religion's view of sex and marriage.
 ...because I have a responsibility to my parents to remain abstinent.
 ...because I have pledged/promised to remain abstinent.
 ...because I know what I want and I will do what it takes to get it (I am strong willed).
 ...because I like being chased and keeping the other person wanting more.
 ...because I want to please my parents by staying abstinent.
 ...because I don't want to have a bad reputation.
 ...because I want to share a similar sexual history with my future partner.
 ...because I don't know what to expect.
 ...because I want to stand out and/or be different.
 ...because I worry about going against my family's religious or cultural values.
 ...because I like to play hard to get.
 ...because I worry what my friends would think if I had sex.
 ...because I'm afraid of regretting having sex.
 ...because if I have an STI, I don't want to pass it on to my partner.
 ...because my religion teaches that sex outside of marriage is wrong.
 ...because I don't want to lose the respect of my partner.
 ...because other things in my life are more important than sex.
 ...because sex is not important to me right now.
 ...because true love is worth waiting for.

Please choose answers that apply to you:

Gender: Male Female

Age: 18 19 20 21 22 23 24 25 26

Ethnic Origin:

American Indian/Alaskan Native

Asian/Pacific Islander

Black/African American

Hispanic

White/Caucasian

Other

Program of Study (program of which your major is housed):

Program listings varied depending on school

Classification: Freshman Sophomore Junior Senior

Religious Affiliation: no religious preference Protestant (ie. Baptist, Methodist, etc.)

Buddhist

Muslim (Moslem)

Catholic

Hindu

Jewish

Other

What is your present sexual activity status: (Choose only one)

Virgin (I have never engaged in sexual intercourse before)

Sexually Active (I had sex in the past, and am not committed to abstinence)

Presently Abstinent (I had sex in the past and have recommitted to remaining abstinent until a specified time in the future).

*** Answer this next question only if you categorized yourself as “Presently Abstinent” above:**

Below is the list of motivations for sexual abstinence that you rated a few minutes ago. Which reason BEST explains why you decided to become sexually abstinent (please select only one):

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- ...because I don't want to disappoint my parents.
- ...because I am afraid my partner may have an STI.
- ...because I am afraid of being compared to somebody else regarding sexual performance.
- ...because I am afraid of a pregnancy.
- ...because I am committed to a higher being (for example: God or Allah).
- ...because I am waiting for the true intimacy that comes with marriage.
- ...because I believe society values virgins more than non-virgins.
- ...because I don't date anyone, and don't have the opportunity.
- ...because I don't want to disappoint my religious community (for example: church family).
- ...because I don't want to feel guilty.
- ...because I am too busy to think about sex.
- ...because I don't want to have to confess/admit to a religious authority and/or community.
- ...because I don't want to lose respect for myself.
- ...because I fear that I don't know how to perform.
- ...because I feel better about myself (have a higher self-esteem) knowing I am abstaining.
- ...because I feel embarrassed to show my body.
- ...because I don't want to commit myself to a relationship.
- ...because I feel I am a role model for my siblings and/or other young people around me.
- ...because I have a commitment with myself to abstain.
- ...because I want to stay consistent with my religion's view of sex and marriage.
- ...because I have a responsibility to my parents to remain abstinent.
- ...because I have pledged/promised to remain abstinent.
- ...because I know what I want and I will do what it takes to get it (I am strong willed).
- ...because I like being chased and keeping the other person wanting more.
- ...because I want to please my parents by staying abstinent.
- ...because I don't want to have a bad reputation.
- ...because I want to share a similar sexual history with my future partner.
- ...because I don't know what to expect.
- ...because I want to stand out and/or be different.
- ...because I worry about going against my family's religious or cultural values.
- ...because I like to play hard to get.
- ...because I worry what my friends would think if I had sex.
- ...because I'm afraid of regretting having sex.

...because if I have an STI, I don't want to pass it on to my partner.
 ...because my religion teaches that sex outside of marriage is wrong.
 ...because I don't want to lose the respect of my partner.
 ...because other things in my life are more important than sex.
 ...because sex is not important to me right now.
 ...because true love is worth waiting for.

This final portion of the survey is taken from the Sexual Ideology Instrument (Lottes, 1996). Please take a few minutes to finish this portion:

For each of the statements below, indicate whether you strongly agree=1; agree=2; are undecided=3; disagree=4; or strongly disagree=5.

Respond the way you really feel, which may or may not be in agreement with the majority of public opinion.

- a) Having a physical attraction to someone would be sufficient for me to enjoy sex with that person.
- b) Masturbation is an acceptable activity for males
- c) I would feel very guilty if I had sexual relations with someone I did NOT love.
- d) I would be very upset if my spouse had had many previous sexual relationships.
- e) A successful and satisfying sex partnership CANNOT be established unless the sex partners are quite willing to be sexually faithful to one another.
- f) It would be difficult for me to enjoy sex with someone I did NOT love.
- g) I approve of a woman having extra-marital sex WITH her husband's consent.
- h) Group sex (sex involving more than two people) is an acceptable sexual activity for men and women.
- i) John is married to Ann. John is strongly attracted to, but not in love with Mary. I approve of John and Mar having sexual relations.
- j) Extra marital sex is always wrong.
- k) I approve of a man having extra-marital sex WITHOUT his wife's consent.
- l) I would NOT object to my spouse having had a couple of previous sexual relationships.
- m) I can accept and do NOT condemn homosexual activities for females.
- n) A man CANNOT have a satisfactory and satisfying sex life without being in love with his sex partner.
- o) Sexual intercourse with someone other than the regular sex partner can bring about an improvement in the sexual relationship of the established pair.
- p) I approve of a man having extra-marital sex WITH his wife's consent.
- q) Masturbation is an acceptable activity for females.
- r) A woman CANNOT have a satisfactory and satisfying sex life without being in love with her sex partner.
- s) Ann is married to John. Ann is strongly attracted to, but not in love with Jim. I approve of Ann and Jim having sexual relations.

- t) Basically, I simply love sex and would enjoy making love to many different people.
- u) I can accept and do NOT condemn homosexual activity for males.
- v) Sexual intercourse is often best when enjoyed for its own sake, rather than for the purpose of expressing love.
- w) I approve of a woman having extramarital sex WITHOUT her husband's consent.
- x) Casual sexual intercourse with a variety of sex partners can be as satisfying and satisfactory as intercourse that is limited to an established sex partnership.

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National Publications:

Bowden, R.G., **Dunsmore, S.**, & Rust, D. (2005). Changes in social physique anxiety during 16-week physical activity courses. *Psychological Reports*, 96, 690-692.

Dunsmore, S.C., & Goodson, P. (2004). *Motivation for healthy behavior: a decade of health promotion research*. Manuscript submitted for publication.

Goodson, P., Buhi, E., & **Dunsmore, S.C.** (in press). Self-esteem and adolescent sexual behaviors, attitudes, and intentions: A systematic review. *Journal of Adolescent Health*.

National Presentations:

Dunsmore, S.C., Goodson, P. *Motivation for healthy behavior: A systematic review of 10 years' research*. Oral Presentation - Society for Public Health Education 2004 Annual Meeting, November 2004, Washington, D.C.

Buhi, E.R., Goodson, P. and **Dunsmore, S.C.** *Self-esteem and adolescent sexual behaviors, attitudes, and intentions: Two decades of research and its methodological characteristics*. Oral Presentation – The Society for the Scientific Study of Sexuality Annual Meeting, November 2004, Orlando, Florida.